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Indian Standard

CODE OF BUILDING BYELAWS

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CONTENTS

| | PAGE |
|-----------------------|------|
| 0. FOREWORD | 4 |
| 1. SCOPE | 6 |
| 2. TERMINOLOGY | 6 |

PART I

| | |
|--|----|
| 3. ADMINISTRATION | 22 |
| 3.1 GENERAL PROVISIONS | 22 |
| 3.2 ENFORCEMENT | 23 |
| 3.3 APPLICATION FOR BUILDING PERMIT | 23 |
| 3.4 BUILDING PERMIT AND OCCUPANCY CERTIFICATE | 23 |
| 3.5 UNSAFE BUILDINGS | 29 |
| 3.6 ENFORCEMENT OF CODE, OFFENCES AND PENALTIES | 30 |
| 3.7 POWER TO MAKE RULES | 31 |

PART II

| | |
|---|----|
| 4. STRUCTURAL SAFETY | 31 |
| 4.1 GENERAL | 31 |
| 4.2 LIVE LOADS AND WIND LOADS IN BUILDINGS | 31 |
| 4.3 FOUNDATIONS | 32 |
| 4.4 WALLS | 32 |
| 4.5 STAIRCASE | 37 |
| 4.6 DAMP-PROOFING | 38 |
| 4.7 INSULATION AGAINST HEAT AND COLD | 38 |
| 4.8 SOUND INSULATION | 39 |

PART III

| | |
|--|----|
| 5. FIRE SAFETY | 39 |
| 5.1 REQUIREMENTS PERTAINING TO THE EXPOSURE OF EXTERIOR WALLS | 39 |
| 5.2 CONSTRUCTIONAL REQUIREMENTS | 39 |
| 5.3 CHIMNEYS, FLUES AND SMOKE PIPES | 41 |
| 5.4 GARAGES | 43 |
| 5.5 SEPARATION OF BUSINESS AND RESIDENTIAL PORTIONS | 43 |
| 5.6 SEPARATION OF DWELLINGS | 43 |
| 5.7 PARTITIONS IN BLOCK OF FLATS | 43 |
| 5.8 COMBUSTIBLE MATERIALS AND STORAGE SPACE | 43 |

PART IV

| | |
|---|----|
| 6. HEALTH, SANITATION AND OTHER REQUIREMENTS | 44 |
| 6.1 MEANS OF ACCESS | 44 |
| 6.2 OPEN SPACE REQUIREMENTS | 45 |

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| | PAGE |
|---|------|
| 6.3 COVERED AREA | 48 |
| 6.4 PROJECTIONS | 49 |
| 6.5 DISTANCE FROM ELECTRIC LINES | 49 |
| 6.6 PLINTH REGULATIONS | 50 |
| 6.7 HEIGHT REGULATIONS | 50 |
| 6.8 SIZE OF ROOMS | 51 |
| 6.9 LIGHTING AND VENTILATION | 51 |
| 6.10 OTHER REQUIREMENTS | 53 |
| 6.11 DRAINAGE AND SANITATION | 54 |
| 6.12 WATER SUPPLY AND SANITARY INSTALLATIONS | 59 |
| 6.13 RAT-PROOFING OF BUILDINGS | 59 |
| 6.14 ARCHITECTURAL FEATURES | 60 |

PART V

| | |
|--|----|
| 7. REQUIREMENTS FOR SPECIFIC USES | 61 |
| 7.1 SINGLE ROOM TENEMENTS | 61 |
| 7.2 DOUBLE ROOM TENEMENTS | 62 |
| 7.3 CINEMAS, THEATRES AND PUBLIC ASSEMBLY HALLS | 63 |
| 7.4 FACTORIES AND INDUSTRIAL BUILDINGS | 64 |
| APPENDIX A | 68 |
| APPENDIX B | 69 |
| APPENDIX C | 69 |
| APPENDIX D | 70 |
| APPENDIX E | 70 |
| APPENDIX F | 71 |

Indian Standard

CODE OF BUILDING BYELAWS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 March 1958, after the draft finalized by the Building Byelaws Sectional Committee had been approved by the Building Division Council.

0.2 Extensive industrial development, slum clearance and rehabilitation facilitated by improved transport facilities have brought about a wide-spread movement of population resulting in haphazard growth of existing towns and cities, and of new urban units. As a result of this growth in the towns and cities, and consequent increase in fire and health hazards, the problem of ensuring good and sound construction has assumed great importance. Safe and sound building construction methods are matters of public interest and, therefore, measures to protect this public interest become necessary. Building byelaws are one of such measures.

0.3 This code is intended to be suitable for adoption either wholly or in parts by the various local bodies wishing to have a building code. As the powers and functions of various local bodies, with respect to building control, vary in different States, it is very desirable that the local bodies obtain legal advice before adopting this code. This is particularly true in the case of administrative requirements covered by Part I of this code.

0.4 This code is identical in scope and procedure, and permits any local body to frame byelaws prescribing the manner in which and the type of materials of which buildings and structures of different classes shall be erected or altered after the adoption of the code. With the object of making it possible for both big cities and small towns to use this code, a high degree of flexibility has been provided. It is, however, important that local bodies should obtain the assistance of qualified and competent personnel in enforcing the provisions of this code. A guide to the qualifications of staff suitable for enforcement of this code as well as architects and engineers who can be registered with the local bodies for the purpose of this code is being prepared jointly by the Institution of Engineers, India, and the Indian Institute of Architects, and reference to this guide is recommended.

0.5 The code and the byelaws which may be framed based on this code should be treated as remedial and should be liberally construed to secure

the beneficial purposes thereof. Building byelaws may be applied for the entire area under a local body or the area may be divided into a number of districts and different requirements set up for each. Any local body, if it so desires, may adopt the code for only a small area which is developed and populated and leave the remainder without restrictions, or with a few regulations governing such critical conditions as fire and health hazards.

0.6 In the formulation of this code, the Sectional Committee responsible for the preparation of this code has taken into consideration the various building byelaws now in force in the country and has also referred to similar byelaws operating in the United Kingdom, the United States of America and Canada.

0.7 This code refers generally to all standard specifications and codes published by the Indian Standards Institution bearing on the subject. In particular, reference to the following Indian Standards has been made:

IS: 460-1953 SPECIFICATION FOR TEST SIEVES

IS: 732-1958 CODE OF PRACTICE FOR ELECTRICAL WIRING AND FITTINGS IN BUILDINGS

IS: 875-1957 CODE OF PRACTICE FOR STRUCTURAL SAFETY OF BUILDINGS: LOADING STANDARDS

IS: 1172-1957 CODE OF BASIC REQUIREMENTS FOR WATER SUPPLY, DRAINAGE AND SANITATION

0.7.1 Wherever a reference to any standard mentioned under **0.7**, except IS: 460-1953, appears in this code, it shall be taken as a reference to the latest version of the standard.

0.8 In pursuance of the decision of the Government of India to introduce a uniform system of weights and measures based on the metric system, in this standard, both metric and their equivalent ft-lb units have been given, preference being given to the metric units. As users of this code get accustomed to the use of metric units, the ft-lb units will be dropped altogether from the standard.

0.9 For the purpose of deciding whether a particular requirement of this code is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1949 Rules for Rounding Off Numerical Values; the number of places retained in the rounded off value should be the same as those of the specified value in the code.

0.10 This code is intended chiefly to provide a model on which Building Byelaws of local bodies could be framed, and it does not include all the necessary provisions of a legal document.

1. SCOPE

1.1 This code stipulates standards, provisions and requirements for safe and stable design, methods of construction and sufficiency of materials in structures and regulations for maintenance of equipment, use and occupancy of all structures and premises.

1.2 The requirements of this code shall be held to be the minimum requirements in the interest of public health, safety and sanitation in the construction of buildings. Constructions and equipment which vary from but equal or exceed the requirements laid down in this code, shall be given due consideration.

2. TERMINOLOGY

2.1 For the purpose of this code, the following definitions shall apply:

Advertising Sign — Any sign, either free, supported or attached to a building or other structure which advertises an individual, a firm, a society or an establishment. It does not include name signs of size 0.3 sq m and less.

Alley — A secondary public thoroughfare which affords a means of access to the abutting property.

Antia or Mamti (Stair Cover) — A cabin-like structure with a covering roof over a staircase and its landing, built to enclose only the stairs for the purpose of providing protection from weather and not used for human habitation.

Apartment House — A building arranged, intended or designed to be occupied by three or more families living independently of each other.

Approved — Approved by the authority having jurisdiction.

Assembly Place — A room, floor area, or building designed, intended or used to seat or accommodate 100 or more persons and used as a place for meetings, entertainments, instructions, worship or any such other use.

Authority Having Jurisdiction — The local body itself which, for the purpose of administering these byelaws, may authorize a committee or an official to act on its behalf.

Balcony — A horizontal projection, including a hand rail, or balustrade, to serve as passage or sitting out place.

Barsati, Saiban or Penthouse — A covered space open at least on one side, constructed on a terraced roof used for shelter during rains.

Basement or Cellar — The lower storey of a building below or partly below ground level.

Bazar or Market — The expression 'bazar' shall be deemed to be synonymous with the expression 'market' and is a place or area reserved or licensed by the authority having jurisdiction for the erection of a group of shops and/or stalls.

Building — Any structure for whatsoever purpose and of whatsoever materials constructed and every part thereof whether used as human habitation or not and includes foundation, plinth walls, chimneys, drainage works, fixed platforms, verandah, balcony, cornice or projection, part of a building or anything affixed thereto or any wall enclosing or intended to enclose any land or space.

Building, Height of — The vertical distance measured, in the case of flat roofs, from the average level of the centre line of the adjoining street to the highest point of the building adjacent to the street wall; and in the case of pitched roofs, up to the point where the external surface of the outer wall intersects the finished surface of the sloping roof, and in the case of gables facing the road, the mid-point between the eaves level and the ridge. Architectural features serving no other function except that of decoration shall be excluded for the purpose of taking heights. If the building does not abut on a street, the height shall be measured above the average level of the ground around and contiguous to the building.

Building, Industrial — A building wholly or principally used as a factory, warehouse, laundry, brewery, distillery, iron foundry or for any other similar purpose.

Building Line — The line up to which the plinth of a building adjoining on a street or on an extension of a street or on a future street may lawfully extend. It includes the lines prescribed, if any, in any scheme.

Building Line, Permissible — A line parallel to the front line of the plot at a distance of the minimum width of the front yard.

Building, Business — A building whose whole or a substantial part, not less than two-thirds of entire floor area, is used or is intended to be used for business purposes.

Building, Public — A building used or intended to be used either ordinarily or occasionally as a church, chapel, temple, mosque or any place of public worship, *dharmashala*, college, school, theatre, cinema, public concert room, public hall, public bath, hospital, hotel, restaurant, lecture room or any other place of public assembly.

Building, Residential — A building used or constructed or adopted to be used wholly or principally for human habitation, and includes garages, stables and other outhouses appurtenant thereto.

Ceiling Height — The vertical distance between the floor and the ceiling.

Chajja — A sloping or horizontal structural overhang usually provided over openings on external walls to provide protection from sun and rain.

Chimney — An upright shaft containing and encasing one or more flues.

Conversion — The change of occupancy or premises to an occupancy or use requiring additional occupancy permit.

Covered Area — Ground area covered by the building immediately above plinth level, but does not include the spaces covered by:

- a) garden, rookery, well and well structures, plant nursery, water pool, swimming pool (if uncovered), platform round a tree, tank, fountain, bench, *chabutra* with open top and unenclosed on sides by walls and the like;
- b) drainage, culvert, conduit, catch-pit, gully pit, chamber, gutter and the like; and
- c) compound wall, gate, unstoreyed porch and portico, slide swing, uncovered staircases, areas covered by *chajja* and the like.

Cross Wall — An internal wall built into an external or party wall up to its roof level and of which it forms the limiting factor for the purposes of deciding its thickness.

Damp-Proof — A course consisting of some appropriate waterproofing material provided to prevent penetration of dampness or moisture from any part of the structure to any other part at a height of not less than 15 cm (or 6 in.) above the surface of the adjoining ground.

Detached Building — A building whose walls and roof are independent of any other building.

Drain — Includes a sewer, pipe, ditch, channel, and any other device for carrying off sewage, offensive matter, polluted water, sullage, waste water, rain water or sub-soil water, and any ejectors, compressed air mains, sealed sewage mains and special machinery or apparatus for raising, collecting, expelling or removing sewage or offensive matter to the sewage outfall.

Drainage — Act, process, method or means of drainage, mode of discharge of water; the system of drains.

Dwelling — A building or a portion thereof which is designed or used wholly or principally for residential purposes.

Dwelling, Single Family — A building designed for occupation by one family.

Dwelling, Two Families — A building designed for occupation by two families.

Dwelling, Multiple — A building designed for occupation by three or more families.

Dwelling Unit — A room or rooms designed and intended for use by an individual or family in which facilities are provided for cooking or for installation of cooking equipment.

Exit — A passage, channel or means of egress from any building, storey or floor area to a street or other open space of safety.

Factory — A place to which the provisions of the Indian Factories Act, 1948 and amendments thereto from time to time apply.

Family — A group of individuals normally related in blood or connected by marriage living together as a single housekeeping unit and having common kitchen arrangements. Customary resident domestic servants shall be considered as adjunct to the term 'family'.

Filling Station — An area of land including any structure or structures thereon, used or designed to be used for the storage and supply of gasoline or oil or other fuel for the propulsion of vehicles.

Fire-Resisting Material — Any of the following materials and the like:

- a) Masonry constructed with good, hard, sound and well-burnt bricks, firebricks, stone or other hard and incombustible materials properly bonded and set in lime-*surkhi*, or lime-sand, or neat cement, or cement-sand mortar;
- b) Reinforced cement concrete, and other incombustible cement products;
- c) Teak, and other hardwoods when used for beams and posts or in combination with iron, the timber and iron being protected by a plastering or coating with an incombustible and non-conducting external coating not less than 5 cm (or 2 in.) thick or in the case of timber not less than 2.5 cm (or 1 in.) thick;
- d) Slates, tiles, bricks, and terracotta when used for covering and corbelling;
- e) Concrete, not less than 10 cm (or 4 in.) in thickness, composed of broken bricks, stone chippings or ballast and lime, cement or calcined gypsum when used for filling in between floor joists; and
- f) Any other material approved by the authority having jurisdiction.

Fire-Resisting Rating — The duration of time in hours which the material or the construction will withstand when subjected to the standard fire tests described in the relevant Indian Standards. The sizes of common building materials and components for different fire-resistance ratings are given in Tables I to IV.

Flue — A confined space provided for the conveyance to the outer air of the products of combustion resulting from the operation of any heat-producing appliance or equipment employing solid, liquid or gaseous fuel.

Footing — The offset portions of a foundation to provide a greater bearing area.

Foundation — That part of a structure which is below the lowermost floor and which provides support for the superstructure and which transmits loads of the superstructure to the bearing materials.

**TABLE I THICKNESSES OF FIRE-RESISTANT WALLS AND
PARTITIONS AND FLOORS FOR DIFFERENT
FIRE-RESISTANCE RATINGS**

| CONSTRUCTION AND MATERIALS | MINIMUM THICKNESS IN CM (EXCLUDING PLASTER) FOR RATING OF | | | |
|---|--|---------|--------|--------------------|
| | 4 Hours | 2 Hours | 1 Hour | $\frac{1}{2}$ Hour |
| (1) | (2) | (3) | (4) | (5) |
| WALLS AND PARTITIONS | | | | |
| Solid construction: | | | | |
| Bricks of clay, concrete or sand-lime: | | | | |
| No plaster | 22* | 22† | 10 | 10 |
| Concrete blocks; class 1 aggregates: | | | | |
| No plaster | — | 10 | 7.5 | 6.4 |
| Plastered at least 1.3 cm thick on each side | — | 10 | 6.4 | 5 |
| Concrete blocks; class 2 aggregates: | | | | |
| No plaster | — | — | 10 | 7.5 |
| Plastered at least 1.3 cm thick on each side | — | 10 | 7.5 | 5 |
| Gypsum blocks: | | | | |
| No plaster | — | 10 | 7.5 | 5 |
| Plastered at least 1.3 cm thick on each side | — | 7.5 | 5 | 5 |
| Wood wool slabs: | | | | |
| Plastered at least 1.3 cm thick on each side | — | 7.5 | 5 | 5 |
| Reinforced concrete: | | | | |
| With reinforcements (placed in two layers in walls over 12.5 cm in thickness) in both the directions spaced not less than 15 cm centres, the volume of the reinforcement being not less than 0.2 percent of the volume of the concrete, concrete cover being not less than 2.5 cm | 18 | 10 | 7.5 | 7.5 |
| Plaster board: | | | | |
| Supported at top and bottom edges in steel channels and plastered on each side at least 1.6 cm thick with gypsum plaster | — | — | 2 | — |

(Continued)

*Where plastered at least 1.3 cm thick on each side with gypsum/vermiculite plaster not leaner than 1 : 2 and where the wall does not exceed 3 m either in height or length, the thickness for this period may be 10 cm.

†Where plastered at least 1.3 cm thick on each side and where the wall does not exceed 3 m either in height or length, the thickness for this period may be 10 cm.

**TABLE I THICKNESSES OF FIRE-RESISTANT WALLS AND
PARTITIONS AND FLOORS FOR DIFFERENT
FIRE-RESISTANCE RATINGS — *Contd***

| CONSTRUCTION AND MATERIALS (1) | MINIMUM THICKNESS IN CM (EXCLUDING PLASTER) FOR RATING OF | | | |
|--|--|----------------|---------------|---------------------------|
| | 4 Hours (2) | 2 Hours (3) | 1 Hour (4) | $\frac{1}{2}$ Hour (5) |
| Glass bricks: | | | | |
| In panels not exceeding 3.7 sq m in area with expansion joints not less than 1 cm per 120 cm width of the panel at each side of the panel and not less than 1 cm per 120 cm of the height of the panel at the top of the panel | — | — | 10 | — |
| Hollow block construction: | | | | |
| Clay blocks: | | | | |
| Plastered at least 1.3 cm thick on each side and shells not less than 2 cm thick: | | | | |
| 1 cell in each block and each block not less than 50 percent solid | — | — | 10 | 7.5 |
| 1 cell in | — | — | 15 | — |
| 2 cells in each block and each block not less than 50 percent solid | — | 22 | 10 | — |
| 2 cells in each block and each block not less than 30 percent solid | — | — | 15 | — |
| Concrete blocks: | | | | |
| Plastered at least 1.3 cm thick on each side and 1 cell in wall thickness: | | | | |
| Class 1 aggregate | 22.5 | 11.5 | 7.5 | 6.4 |
| Class 2 aggregate | — | — | 22.5 | 7.5 |
| Gypsum blocks: | | | | |
| Not less than 70 percent solid: | | | | |
| No plaster | — | 10 | 7.5 | 5 |
| Plastered at least 1.3 cm thick on each side | — | 7.5 | 5 | 5 |
| FLOORS (Thickness in cm, <i>min</i>) | | | | |
| Filler joist construction: | | | | |
| Thickness of concrete | 15 | 12.5 | 10 | 9 |
| Concrete cover on bottom of joist | 2.5 | 2.5 | 1.3 | 1.3 |
| Solid reinforced concrete construction (including flat slab construction and floors constructed of pre-cast inverted 'U', channel or T-sections, without a ceiling or soffit): | | | | |
| Thickness of concrete | 15 | 12.5 | 10 | 9 |
| Concrete cover to reinforcement | 2.5 | 1.3 | 1.3 | 1.3 |

(Continued)

TABLE I THICKNESSES OF FIRE-RESISTANT WALLS AND PARTITIONS AND FLOORS FOR DIFFERENT FIRE-RESISTANCE RATINGS — Contd

| CONSTRUCTION AND MATERIALS | MINIMUM THICKNESS IN CM (EXCLUDING PLASTER) FOR RATING OF | | | |
|---|---|---------|--------|--------------------|
| | 4 Hours | 2 Hours | 1 Hour | $\frac{1}{2}$ Hour |
| (1) | (2) | (3) | (4) | (5) |
| Hollow block floor construction (including floors constructed of pre-cast concrete units of box section or I-section): | | | | |
| Aggregate thickness of incombustible material (excluding ceiling finishes, if any) | 12.5 | 9 | 7.5 | 6.4 |
| Concrete cover to reinforcement | 2.5 | 1.3 | 1.3 | 1.3 |
| Structural timber construction: | | | | |
| Boards 2.2 cm thick on timber joists not less than 17.8 cm deep by 5.1 cm wide: | | | | |
| a) Tongued and grooved boards with ceiling of: | | | | |
| 1) Timber lath and plaster — thickness of plaster | — | — | — | 1.6 |
| 2) Metal lath and plaster — thickness of each | — | — | — | 1.6 |
| 3) Two layers of plaster-board — thickness of each | — | — | — | 1 |
| 4) One layer of plaster-board — thickness | — | — | — | 2 |
| 5) One layer of plaster-board of minimum thickness of 1 cm covered with gypsum plaster — thickness | — | — | — | 1.6 |
| 6) 1.3 cm thick insulating board finished with the coats of plaster to a total thickness of | — | — | — | 1.3 |
| b) Plain edge boarding with ceiling of: | | | | |
| 1) Metal lath and plaster — thickness plaster of | — | — | — | 1.3 |
| 2) Timber lath and plaster with plaster of minimum thickness of 1.6 cm, covered with sheets of plaster-board of minimum thickness | — | — | — | 1 |

NOTES — 1) Class 1 aggregates mean foamed slag, pumice, blast-furnace slag, crushed brick and burnt clay products, including expanded clay, well burnt clinker, crushed limestone.

2) Class 2 aggregates mean flint, gravel, granite and all crushed natural stones other than limestone.

TABLE II THICKNESSES OF PLASTER FOR FIRE-RESISTANT HOLLOW TIMBER FRAME PARTITIONS FOR DIFFERENT FIRE-RESISTANCE RATINGS

| CONSTRUCTION AND MATERIALS (1) | MINIMUM THICKNESS OF PLASTER IN CM ON EACH FACE FOR RATING OF | | | |
|--|--|----------------|---------------|-------------------------------|
| | 4 Hours (2) | 2 Hours (3) | 1 Hour (4) | $\frac{1}{2}$ Hour (5) |
| Steel or timber studding: | | | | |
| Plaster on metal or timber lathing: Portland cement plaster, or Portland cement-lime plaster or gypsum plaster | — | — | 2 | 1.3 |
| Plaster-board with or without gypsum plaster: | | | | |
| 1 cm thick plaster-board on each side | — | — | — | 0.5 (neat, single coat) |
| 1 cm thick perforated plaster-board on each side | — | — | 1.3 | — |
| 1.3 cm thick plaster-board on each side | — | — | 1 | — |

TABLE III THICKNESSES OF PROTECTION FOR FIRE-RESISTANT STEEL COLUMNS AND BEAMS FOR DIFFERENT FIRE-RESISTANCE RATINGS

| CONSTRUCTION AND MATERIALS (1) | MINIMUM THICKNESS IN CM FOR RATING OF | | | |
|---|---------------------------------------|----------------|---------------|---------------------------|
| | 4 Hours (2) | 2 Hours (3) | 1 Hour (4) | $\frac{1}{2}$ Hour (5) |
| Solid protection: | | | | |
| Columns: | | | | |
| Reinforced concrete | 6.4* | 5* | 2.5 | 2.5 |
| Solid bricks of burnt clay or sand lime | 7.5 | 5 | 5 | 5 |
| Solid blocks reinforced in every hori- zontal joint: | | | | |
| 1) Foamed slag or pumice concrete | 6.4 | 5 | 5 | 5 |
| 2) Gypsum blocks | 5 | 5 | 5 | 5 |
| Sprayed asbestos | 5 | 2.5 | 1.3 | 1.3 |

(Continued)

*The thickness of protection on any projecting cleat, projecting rivet head and the like need not exceed 2.5 cm.

TABLE III THICKNESSES OF PROTECTION FOR FIRE-RESISTANT STEEL COLUMNS AND BEAMS FOR DIFFERENT FIRE-RESISTANCE RATINGS — *Contd*

| CONSTRUCTION AND MATERIALS (1) | MINIMUM THICKNESS IN CM FOR RATING OF | | | |
|---|---------------------------------------|---------|--------|--------------------|
| | 4 Hours | 2 Hours | 1 Hour | $\frac{1}{2}$ Hour |
| (2) | (3) | (4) | (5) | |
| Beams: | | | | |
| Reinforced concrete | 6.4* | 5* | 2.5 | 2.5 |
| Sprayed asbestos | 5 | 2.5 | 1.3 | 0.6 |
| Hollow protection: | | | | |
| Columns: | | | | |
| Solid bricks of burnt clay or sand lime reinforced in every horizontal joint | 11.5 | 7.5 | 5 | 5 |
| Solid bricks of foamed slag or pumice concrete or gypsum reinforced in every horizontal joint | 7.5 | 5 | 5 | 5 |
| Moulded asbestos bound in position with nicrome wire not less than 1.626 mm (16 SWG) in thickness, the wires to be sunk not less than 3 mm deep in the outer surface of the asbestos and the grooves and all joints in the asbestos to be filled with refractory cement | 6.4 | 4 | 2.5 | 2.5 |
| Portland cement plaster or Portland cement-lime plaster on metal lathing | — | — | — | 2 |
| Portland cement plaster or Portland cement-lime plaster on metal lathing with reinforcement over rendering coat | — | — | 2.5 | — |
| Gypsum plaster on metal lathing | — | — | 2.3 | 1.6 |
| Gypsum plaster on 1 cm gypsum plaster board with 1.626 mm (16 SWG) wire binding at 10 cm pitch | — | — | 1.3 | — |
| Gypsum plaster on 2 cm plaster board with 1.626 mm (16 SWG) wire binding at 10 cm pitch | — | 1.3 | — | — |
| Two layers of metal lathing plastered with gypsum plaster on each layer, each | 2 | — | — | — |
| Pre-cast concrete consisting of 4 volumes of vermiculite to 1 volume of Portland cement, reinforced with expanded metal, wire mesh or with 1.626 mm (16 SWG) wire binding at 10 cm pitch | — | — | 2.5 | — |

(Continued)

*The thickness of protection on the upper surface of the upper flange of an internal beam, and on any projecting cleat, projecting rivet head and the like need not exceed 2.5 cm.

TABLE III THICKNESSES OF PROTECTION FOR FIRE-RESISTANT STEEL COLUMNS AND BEAMS FOR DIFFERENT FIRE-RESISTANCE RATINGS — Contd

| CONSTRUCTION AND MATERIALS (1) | MINIMUM THICKNESS IN CM FOR RATING OF | | | |
|---|---------------------------------------|----------------|---------------|----------------------------|
| | 4 Hours (2) | 2 Hours (3) | 1 Hour (4) | ½ Hour (5) |
| Beams: | | | | |
| Moulded asbestos bound in position with nicrome wire not less than 1.626 mm (16 SWG) in thickness, the wires to be sunk in grooves not less than 1 cm deep in the outer surface of the asbestos and the grooves and all joints in the asbestos to be filled with refractory cement. | 6.4 | 4 | 2.5 | 2.5 |
| Portland cement plaster or Portland cement-lime plaster on metal lathing | — | — | — | 2 |
| Portland cement plaster or Portland cement-lime plaster on metal lathing with reinforcement over the rendering coat | — | — | 2.5 | — |
| Gypsum plaster and metal lathing | — | 2.3 | 1.6 | — |
| Gypsum plaster on 1 cm gypsum plaster-board with 1.626 mm (16 SWG) wire binding at 10 cm pitch | — | — | 1.3 | — |
| Gypsum plaster on 1 cm gypsum plaster-board supported on wood battens | — | — | — | 0.5 (neat, single coat) |
| Gypsum plaster on 2 cm gypsum plaster-board with 1.626 mm (16 SWG) wire binding at 10 cm pitch | — | 1.3 | — | — |
| Pre-cast concrete consisting of 4 volumes of vermiculite to 1 volume of Portland cement reinforced with expanded metal, wire mesh or with 1.626 mm (16 SWG) wire binding at 10 cm pitch | — | — | 2.5 | — |

- NOTES** — 1) Solid construction means casing which is bedded close up to steel without any intervening cavities and with all joints in that casing made full and solid.
- 2) Hollow protection means that there is a void between the protective material and steel. All hollow protection to columns shall be effectively sealed at each floor level.
- 3) Where reinforcement is required, it shall consist of steel binding wire not less than 2.337 mm (13 SWG) in thickness, or a steel mesh weighing not less than 0.54 kg per sq m. In concrete protection, the spacing of that reinforcement shall not exceed 30 cm in any direction.

TABLE IV SIZES OF FIRE-RESISTANT REINFORCED CONCRETE COLUMNS AND BEAMS FOR DIFFERENT FIRE-RESISTANCE RATINGS

| CONSTRUCTION AND MATERIALS | MINIMUM OVERALL SIZE IN CM FOR RATING OF | | | |
|---|--|---------|--------|--------------------|
| | 4 Hours | 2 Hours | 1 Hour | $\frac{1}{2}$ Hour |
| (1) | (2) | (3) | (4) | (5) |
| Reinforced concrete columns | — | 30.5 | 25.5 | 20.5 |
| Reinforced concrete columns with light 5 cm mesh reinforcement placed centrally in the concrete cover to longitudinal reinforcement | 30.5 | 25.5 | — | — |
| MINIMUM CONCRETE COVER TO REINFORCEMENT IN CM | | | | |
| | 4 Hours | 2 Hours | 1 Hour | $\frac{1}{2}$ Hour |
| Reinforced concrete beams | 6.4 | 5 | 4 | 2.5 |

Frame Building — A building in which the loads, either dead or super-imposed, are carried by means of timber, reinforced concrete or steel framing and where the functions of walls are to divide or to enclose space.

NOTE — In the case of a building having masonry load-bearing external walls with an internal steel or reinforced cement concrete frame, the external walls shall be as prescribed for masonry walled building and the internal frame shall be as prescribed for frame buildings.

Gallery — The raised portion of a room which remains open to the room. The floor of the gallery may be either level or stepped. If the space below the gallery is enclosed or divided off from the room, the space so enclosed remains a ground floor room. If the side of the gallery which was open to the room is filled by a wall or partition, the gallery becomes a mezzanine floor.

Garage, Private — A building or outhouse designed or used for the storage of private owned motor driven or other vehicles.

Garage, Public — A building or portion thereof, other than a private garage, operated for gain, designed or used for repairing, servicing, hiring, selling or storing motor driven or other vehicles.

Ground Floor — That storey of a building to which there is an entrance from the outside of the adjacent ground or street.

Habitable Room — A room occupied or designed for occupancy by one or more persons for study, living, sleeping, eating, kitchen if it is used as a living room, but not including bathrooms, water-closet compartments, laundries, serving and storage pantries, corridors, cellars, attics, and spaces that are not used frequently or during extended periods.

Head Room or Headway — The vertical distance between the floor and the ceiling. Where a finished ceiling is not provided, the under side of the joists or beams or tie beams shall determine the upper point of measurement.

Hotel — A building used as the abiding place for more than 15 persons who are for compensation lodged with or without meals.

Non-Inflammable Materials — Materials in which charring or scorching does not reach the edge of the under face of a 152.4 mm (6 in.) unperforated square sheet or to 76.2 mm (3 in.) from the point of application of the spirit flame when a larger sheet is tested and which, when a perforated sheet is tested, do not continue to glow or carry flame after the spirit test flame has burnt out.

Latrine, Connected — A latrine connected to the municipal sewer system.

Latrine, Drop — A latrine on an upper storey, the excreta from which fall through an opening to the ground floor.

Latrine, Unconnected — A latrine not connected to the municipal sewer system. It may be connected to a septic tank.

Latrine, Service — A latrine from which the excreta are removed by manual agency and not by water carriage.

Ledge or Tand — A shelf-like projection supported in any manner whatsoever, except by means of vertical supports, within a room itself but not having projection wider than 0.75 m (or 2 ft 6 in.).

Load, Dead — The weight of all permanent stationary construction becoming a part of the structure.

Load, Live — All loads except dead loads that may be imposed on a structure. Wind loads shall be considered as live loads.

Loft — A residual space in a pitched roof, or any similar residual space, above normal floor level, which may be constructed or adopted for storage purposes.

Masonry — The form of construction composed of bricks, stones, structural clay tiles, concrete blocks, gypsum or other similar building units or materials or a combination of these materials laid up unit by unit, bonded together and set in mortar.

Mezzanine Floor — A level, intermediate floor in any storey, overhanging and overlooking a floor beneath.

Non-combustible — This term shall be applied to materials only. A non-combustible material is one which neither burns nor gives off inflammable vapours in sufficient quantity to ignite at a pilot flame.

Non-conforming Building or Non-conforming Use — A building, structure or use of land existing at the time of commencement of this code and which does not conform to the regulations of the district or zone in which it is situated.

Nuisance — Nuisance means and includes any act, omission, place or thing, which causes or is likely to cause injury, danger, annoyance or offence

to the sense of sight, smell, or hearing or disturbance to rest or sleep, or which is or may be dangerous to life or injurious to health or property.

Occupier — Occupier includes any person for the time being, paying or liable to pay rent or any portion of rent of the land or building in respect of which the word is used, or compensation or premium on account of the occupation of such land or building and also a rent-free tenant, but does not include a lodger, and the words 'occupy' and 'occupation' do not refer to the lodger.

Provided that an owner living in or otherwise using his own land or building shall be deemed to be the occupier thereof.

Owner — The word, when used in reference to any premises, means the person who receives the rent of the said premises or would be entitled to do so if the premises were let. It also includes:

- a) an agent or trustee who receives such rent on behalf of the owner;
- b) a receiver, executor or administrator or a manager appointed by any court of competent jurisdiction to have the charge of, or to exercise the rights of, an owner of the said premises;
- c) an agent or trustee who receives the rent of or is entrusted with or is concerned with any premises devoted to religious or charitable purposes; and
- d) a mortgage in possession.

Open Space — An area, forming an integral part of the plot, left open to the sky.

Parapet — A low wall built along the edge of a roof or a floor not more than 1.2 m (or 4 ft) in height.

Parking Space — An area enclosed or unenclosed sufficient in size to park vehicles together with a driveway connecting the parking space with a street or alley and permitting ingress and egress of the vehicle.

Partition — A wall which supports no load other than its own weight.

Pathway — An approach constructed with materials, such as bricks, *murrum*, concrete, stone, asphalt, or the like.

Pilaster — A pier forming part of a wall partially projecting therefrom and bonded thereto.

Plinth — The portion of a structure between the surface of the surrounding ground and surface of the floor, first above the ground.

Plot — A parcel (piece of land) occupied or intended for occupancy by one main building, together with its accessory buildings and used, customarily and incidental to it, including the open spaces required by these byelaws and having frontage upon a street or upon a private way that has officially been approved by the authority having jurisdiction.

Plot, Corner — A plot at the junctions of and fronting on two or more intersecting streets.

Plot, Depth of — The mean horizontal distance between the front and rear plot boundaries.

Plot, Double Frontage — A plot having a frontage on two streets other than a corner plot.

Plot, Interior or Tandem — A plot access to which is by a passage from a street whether such passage forms part of the plot or not.

Porch — A covered surface supported on pillars or otherwise for the purpose of pedestrian or vehicular approach to a building.

Rain Water Pipe — A pipe or drain situated wholly above the ground and used or constructed to be used for carrying water directly from roof, surface of elevated courtyard or other open surface.

Registered Architect/Engineer — A qualified architect/engineer who has been registered by the authority having jurisdiction.

Road or Street — Any highway, street, lane, pathway, alley, stairway, passageway, carriageway, footway, square, place or bridge, whether a thoroughfare or not over which the public have a right of passage or access or have passed and had access uninterruptedly for a specified period, whether existing or proposed in any scheme, and includes all bunds, channels, ditches, storm water drains, culverts, sidewalks, traffic islands, roadside trees and hedges, retaining walls, fences, barriers and railings within the road lines.

Road Line — The line defining the side limits of a road.

Saiban or Penthouse — See 'Barsati'.

Sanctioned Plan — The set of drawings and statements submitted under these regulations in connection with a building and duly approved and sanctioned by the authority having jurisdiction.

Service Road — A road provided at the rear or side of a plot for service purposes.

Set-back Line — A prescribed building line drawn with reference to the centre line of a street and laid down in each case by the authority having jurisdiction, on the street side of which nothing can be erected or re-erected save with the permission of the authority having jurisdiction.

Service Station — Any area or structure used or designed to be used for polishing, greasing, washing, spraying, dry-cleaning or otherwise cleaning or serving automotive vehicles.

Sewage Drain — A drain used or constructed to be used for conveying solid or liquid waste matter, excremental or otherwise, to a sewer.

Shop — A building or part of a building where articles of food and of personal, domestic and household use and consumption are sold and goods of any kind are ordinarily retailed. It does not include a workshop.

Site — The entire area covered by a building with outhouses and also the land at the front, rear and sides of such buildings and pertaining thereto and required by rules to be left open.

Slopsink — A sink used or constructed to be used for receiving solid or liquid excremental matter.

Smoke Pipe — A pipe, whether horizontal, of metal or other material in which smoke from the combustion are conducted from a furnace to a chimney.

Storey — The portion of a building included between the surface of any floor and the surface of the floor next above it or if there be no floor above it, then the space between any floor and the ceiling next above it.

Storey, Topmost — The uppermost storey in a building whether constructed wholly or partly on the roof.

Street — See 'Road'.

Street Line — See 'Road Line'.

Street Level or Grade — The officially established elevation of the centre line of the street upon which a plot fronts and if there is no officially established grade, the existing grade of the street at its mid-point.

Structure — Anything that is built or constructed, an edifice or building of any kind or any piece of work artificially built up or composed of parts joined together in some definite manner. The term 'structure' shall be including 'building'.

Tenement — A part of a building intended or used or likely to be used as a dwelling unit for a family.

To Abut — To abut on a road such that any portion of the building is on the road boundary.

To Erect — To construct a building for the first time or to reconstruct existing building after demolishing it according to some fresh or revised plans.

To Make Material Alterations — To make any modification in any existing building by way of addition or alteration, or any other change in the roof, window, door, compound, sanitary and drainage system in any respect whatsoever. Opening of a window and providing intercommunication doors shall not be considered as material alterations. Similarly modifications in respect of gardening, white washing, painting, retiling and other decorative works shall not be deemed to be material alterations. It further includes:

- a) conversion of a building or any part thereof for human habitation as one dwelling house into more than one dwelling house and vice versa,
- b) conversion of a building or a part thereof suitable for human habitation into a dwelling house or vice versa,

- c) conversion of a dwelling house or a part thereof into a shop, warehouse or factory or vice versa, and
- d) conversion of a building used or intended to be used for one purpose, such as shop, warehouse, factory, etc, into one for another purpose.

To Re-erect — To construct for a second time or subsequent times a building or a part of a building after demolishing it, on the same plan as had been previously sanctioned.

Wall, External — An outer wall or a vertical enclosure of any building not being a party wall even though adjoining a wall of another building; it also means a wall abutting on an interior open space of any building.

Wall, Party — A wall built on land belonging to two adjoining owners, the wall being the joint property of both owners. If each of the two adjoining owners builds a dividing wall on their own property, they are not 'Party Walls' and no part of the footings of either wall shall project on to the land of the adjoining owner, except by legal agreement between the owners. Any such 'party' or 'dividing' wall shall be considered, for the purposes of these byelaws, as being equivalent to an external wall, as far as thickness and height are concerned.

Wall, Party, Compound — A wall, used or constructed to be used for separation of adjoining lands of different owners and not being part of a building, but does not include a wall constructed on the land of one owner, the footings of which project over the land of another owner.

Warehouse — A building the whole or a substantial part of which is used or intended to be used for the storage of goods whether for keeping or for sale or for any similar purpose but does not include a store room attached to and used for the proper functioning of a shop.

Window — An opening to the outside other than a door which provides all or part of the required natural light, and ventilation or both to an interior space.

Water Closet (WC) — A privy with arrangement for flushing the pan with water. It does not include a bathroom.

Workshop — A building where not more than ten technical persons are employed in any repair or light manufacturing process.

Yard — An open space at ground level between a building and the adjoining boundary lines of the plot unoccupied and unobstructed except by encroachments or structures specifically permitted by these byelaws, on the same plot with a building. All yard measurements shall be the minimum distances between the front, rear and side yard plot boundaries as the case may be, and the nearest point of the building including enclosed or covered porches. Every part of every yard shall be accessible from every other part of the same yard.

Yard, Front — A yard extending across the front of a plot between the side yard lines and being the minimum horizontal distance between the

street line and the main building or any projection thereof other than steps, unenclosed balconies and unenclosed porches.

Yard, Rear — A yard extending across the rear of a plot measured between plot boundaries and being the minimum horizontal distance between the rear plot boundary and the rear of the building or any projections other than steps, unenclosed balconies or unenclosed porches. In a corner plot, the rear yard shall be considered as parallel to the street upon which the plot has its least dimensions; in both the corner and interior plots the rear yard shall be at the opposite end of the plot from the front yard.

Yard, Side — A yard between the building and the side line of the plot and extending from the front line to the rear line of the plot and being the minimum horizontal distance between a side boundary line and the sides of the building or any other projections other than steps, unenclosed balconies or unenclosed porches.

Zoning Regulations — Any regulations or plan governing land use, approved by the authority having jurisdiction.

PART I

3. ADMINISTRATION

3.1 General Provisions

3.1.1 For the purpose of this code, the use of the present tense includes the future tense, the masculine gender includes the feminine and the neuter, the singular number includes the plural and the plural number includes the singular. The word 'person' includes a Corporation as well as an individual, 'writing' includes printing and typing, and 'signature' includes a thumb impression made by a person who cannot write, if his name is written near to such thumb impression.

3.1.2 Interpretation — Whenever applicable, the provisions of this code shall also apply to structures other than buildings and the term 'buildings' shall be understood to include such other structures.

3.1.3 The heading which appears at the beginning of a section, article, item or sub-item of this code shall be deemed to be a part of such section, article, item or sub-item respectively.

3.1.4 New Materials and Methods of Construction — Materials and methods of construction not specifically provided in the code may be permitted provided that:

- a) such alternative types of construction or materials comply with appropriate Indian Standards; or
- b) where no Indian Standards are available for such alternative type of construction or materials, their suitability and safe working stresses

have been approved by the authority having jurisdiction on the basis of reports of national institutions like the Central Building Research Institute, Roorkee; Government Test House, Calcutta; National Buildings Organization, New Delhi; etc.

3.2 Enforcement

3.2.1 The provisions of this code shall be enforced by the authority having jurisdiction or by a committee or an official or officials duly appointed by the authority having jurisdiction for such purpose.

3.2.2 Records — The authority having jurisdiction shall keep proper records of all applications received, permits and orders issued, inspections made and shall retain copies of all papers and documents connected with the administration of its duties.

3.2.3 Inspection — The authority having jurisdiction may, at all reasonable hours, normally between sunrise and sunset, enter into or upon any building or premises for the purpose of ascertaining whether or not the provisions of this code are being complied with.

3.3 Application for Building Permit

3.3.1 New Buildings — No building or any part of a building shall hereafter be erected except in conformity with the provisions of this code.

3.3.2 Existing Buildings — Nothing in this code shall require the removal, alteration or abandonment, nor prevent continuance of the use or occupancy of an existing building, unless in the opinion of the authority having jurisdiction, such building constitutes a hazard to the safety of the adjacent property or the occupants of the building itself.

3.3.3 Precode Building Permits — If any building, permit for which had been issued before the commencement of this code, is not wholly completed within a period of three years from the date of such permit, the said permission shall be deemed to have lapsed and fresh permit shall be necessary to proceed further with the work in accordance with the provisions of this code.

3.3.4 Alterations, Additions and Change of Use or Occupancy — All material alterations, additions or conversion to another use, made hereafter whether to existing buildings or to buildings hereafter erected shall conform to the requirements of this code and subject to permit as herein after provided.

3.4 Building Permit and Occupancy Certificate

3.4.1 Building Permit

3.4.1.1 Notice — Every person who intends to erect, re-erect or make material alteration in any place in a building or to make or enlarge a well,

shall give notice in writing to the authority having jurisdiction of his said intention in the form prescribed (*see* Appendix A) from time to time and such notice shall be accompanied by plans and statements in triplicate, as required under 3.4.2 and 3.4.3. The plans may be ordinary prints on ferro paper. One set of such plans shall be retained in the office of the authority having jurisdiction for record after the issue of a permit or a refusal.

3.4.1.2 Every Government department, as far as possible, shall comply with all the provisions of this code. They shall also notify with plans, their intention, to the authority having jurisdiction but may not wait for the permit for starting the work. Where objections have been pointed out by the authority having jurisdiction, it shall be obligatory for the department to take necessary action to obviate these objections as laid down in Government Building Act, 1898.

3.4.2 Plans Accompanying Notice — The following shall accompany the notice:

a) *Site Plan* — The site plans sent with an application for permit shall be drawn to a scale of not less than 8 m to 1 cm (or 64 ft to 1 in.) and shall show:

- 1) the boundaries of the site and of any contiguous land belonging to the owner thereof;
- 2) the position of the site in relation to neighbouring streets;
- 3) the name of the street in which the building is proposed to be situated;
- 4) all existing buildings standing on the site;
- 5) the position of the building, and of all other buildings (if any), which the applicant intends to erect upon his contiguous land referred to in (1) in relation to
 - i) the boundaries of the site, and in a case where the site has been partitioned, the boundaries of the portion owned by the applicant and also of the portions owned by the other owners,
 - ii) all adjacent streets, buildings and premises within a distance of 12 m (or 40 ft) of the site and of the contiguous land (if any) referred to in (1), and
 - iii) if there is no street within a distance of 12 m (or 40 ft) of the site, the nearest existing street.
- 6) the means of access from the street to the building, and to all other buildings (if any) which the applicant intends to erect upon his contiguous land referred to in (1);
- 7) the position and the number of storeys of all other buildings within 12 m (or 40 ft) of the site;

- 8) the positions, forms and dimensions of kitchens, staircases, privies, urinals, drains, cesspools, stables, cattle sheds, cow-houses, wells and other appurtenances of the building;
 - 9) free passage or way in front of the building;
 - 10) space to be left about the building to secure a free circulation of air, admission of light and access for scavenging purposes;
 - 11) the width of the street (if any) in front and of the street (if any) at the side or rear of the buildings; and
 - 12) such other particulars as may be prescribed by the authority having jurisdiction.
- b) *Building Plans* — The plans of the building and elevations and sections accompanying the notice shall be accurately drawn to a scale of 1 m to 1 cm (or 8 ft to 1 in.) and coloured as laid down in (e) below. Adequate arrangement for proper drainage shall also be made. The plans shall include:
- 1) floor plans of all floors together with the covered area, accessory buildings and basement plan. Such drawings shall clearly indicate the sizes and spacings of all supporting members, sizes of rooms;
 - 2) exact location of essential services, e.g. WC, sink, bath and the like;
 - 3) sectional drawings clearly the sizes of footings, thickness of basem roof slabs and floor slabs, wall construction, sizes and spacing of framing members, ceiling heights and parapet heights with their materials. The section should indicate the drainage and the slope of the roof. At least one section should be taken through the staircase;
 - 4) all street elevations;
 - 5) details of served privy, if any;
 - 6) dimensions of the projected portions beyond the permissible building line;
 - 7) terrace plan indicating the drainage and the slope of the roof; and
 - 8) indication of the north line.
- c) *Private Water Supply and Sewage Disposal System* — Plans and sections of private water supply and sewage disposal system, if any, shall also be included.
- d) *Signing the Plans* — All the plans shall be duly signed by the owner and the registered architect/engineer and shall indicate their names, addresses, qualifications and registered numbers allotted by the authority having jurisdiction.

e) *Recommended Notation for Colouring the Plan* — Shall be as in the following table :

| ITEM | SITE PLAN | | BUILDING PLAN | |
|--------------------------------|--------------------|--------------------|---------------|---------------|
| | White Plan | Blue Print | White Plan | Blue Print |
| Existing work | Black (outline) | White | Black | White |
| Proposed work | Red filled in | Red | Red | Red |
| Drainage and sewage work | Red dotted | Red dotted | Red dotted | Red dotted |
| Water supply works | Black dotted | Black dotted | Black dotted | Black dotted |
| Work proposed to be dismantled | Yellowhatched | Yellowhatched | Yellowhatched | Yellowhatched |
| Open spaces | No colour | No colour | --- | --- |
| Plot lines | Thick black | Thick black | --- | --- |
| Permissible building lines | Thick dotted black | Thick dotted black | --- | --- |
| Existing street(s) | Green | Green | --- | --- |
| Future street(s), if any | Green dotted | Green dotted | --- | --- |

3.4.3 Specifications — Specifications, both general and detailed, giving kind and grade of materials to be used, duly signed by the registered architect/engineer, shall accompany the notice.

3.4.3.1 Supervision — The notice shall be further accompanied by a declaration in the prescribed form (*see* Appendix B) by the registered architect/engineer undertaking the supervision.

3.4.4 Notice for Alteration Only — When the notice is only for an alteration of the building, only such plans and statements, as may be necessary, shall accompany the notice.

3.4.5 Repairs — No such notice shall be deemed necessary for repairs in any existing building in accordance with these byelaws, except the repairs to the building within the building line of the street.

In the above case no notice or plan is necessary, but if for purposes of verification and assessment the authority having jurisdiction requires a registered intimation specifying the nature of the work together with the plan, it shall be supplied.

3.4.6 Deviations During Construction — If during the construction of a building any departure of a substantial nature from the sanctioned plan is intended to be made, sanction of the authority having jurisdiction shall be obtained before the change is made. The revised plan showing the deviations shall be submitted and the procedure laid down for the original plan heretofore shall apply to all such amended plans except that the time limit specified under 3.4.15 shall be three weeks in such cases.

Minor alterations of the nature of shifting of doors and windows, pillars or fireplaces which do not conflict with the byelaws may, however, be made by the owner and shown in the completion plan. The decision of the authority having jurisdiction whether the alterations made are of a minor or substantial nature shall be final.

3.4.7 Notice for Land Adjoining the Government or Corporate Bodies Formed Under the Statute — In case of a notice of intention to erect, re-erect or make a material alteration in a building or to make or enlarge a well or wells abutting a road maintained by Public Works Department, military, canal or other Government property, the notice shall be in duplicate and the plans in quadruplicate and a site plan in duplicate. One copy of the notice with the plan and the site plan shall on receipt be forwarded by the authority having jurisdiction to the officer-in-charge of the Public Works Department, military, canal or other Government property for report before the permission is granted, who shall report to the authority having jurisdiction within two weeks from the date of the receipt of the notice whether or not he has any objection to the proposed construction.

3.4.8 Fees — No notice as referred to above in 3.4.1.1 shall be deemed valid unless and until the person giving notice has paid the fees given below to the authority having jurisdiction and an attested copy of the receipt of such payment is attached with the notice.

- a) For the first.....of
cubic contents or part thereof.....Rs.....
- b) For each additional.....of
cubic contents or part thereof
(subject to a maximum of Rs.....).....Rs.....

In the event a building permit is not issued, the fees so paid shall not be returned to the owner, but he shall be allowed to re-submit it without any fees after complying with all the objections raised by the authority having jurisdiction within a period of one year from the date of rejection after which fresh fees shall have to be paid.

3.4.9 Duration of Sanction — The sanction once accorded shall remain valid up to three years during which period completion certificate from the registered architect/engineer, in the form prescribed (see Appendix D) shall be submitted and if this is not done the permit shall be got revalidated before the expiration of this period. Revalidation shall be subject to the rules then in force.

3.4.10 Notification Stages — As work progresses under a building permit, the holder thereof shall cause the authority having jurisdiction to be notified at the following stages of construction:

- a) Upon commencement of the work in the form prescribed (see Appendix C);

- b) Upon completion of the footings and before erection of the foundation walls; and
- c) Upon total completion of the work authorized by the building permit and before occupancy.

3.4.10.1 Inspection as required under **3.4.10** (a) and (b) shall be made within seven days following the receipt of notification after which period the owner will be free to continue the construction according to the sanctioned plan. At the first inspection the authority having jurisdiction shall determine to the best of its ability that the building has been located in accordance with the site plans and yard area complying with the requirements of these byelaws. The final inspection indicated under **3.4.10** (c) shall be made within 21 days following the receipt of notification for the grant of occupancy certificate.

3.4.11 Construction not According to Plan—Should the authority having jurisdiction determine at any stage that the construction is not proceeding according to the sanctioned plan or is in violation of any of the provisions of these byelaws, or any other applicable code, regulation, act or byelaw, it shall notify the owner, and all further work shall be stayed until correction has been effected and approved upon notice and request for re-inspection duly made.

Should the owner fail to comply with the requirements at any stage of construction, the authority having jurisdiction is empowered to cancel the building permit issued and shall cause notice of such cancellation to be securely posted upon the said construction, if the owner is not traceable at his address given in the notice. Posting of such a notice shall be considered sufficient notification of cancellation to the owner thereof. No further work shall be undertaken or permitted upon such construction until a valid building permit thereafter has been issued.

3.4.12 Revocation of Permit—The authority having jurisdiction may revoke any permit issued under the provisions of this code, wherever there has been any false statement or any misrepresentation of any material fact in the application on which the permit was based.

3.4.13 Qualifications of the Architect/Engineer—Architects and engineers referred to under **3.4.2** (d) and **3.4.3** shall be registered with the authority having jurisdiction, as competent to do the work for which they are employed. The qualifications of the architect/engineer shall be fixed by the authority having jurisdiction.

3.4.14 Grant of Permit or Refusal—The authority having jurisdiction may either sanction or refuse the plans and statements or may sanction them with such modifications or directions as it may deem necessary and thereupon shall communicate its decision to the person giving the notice. In the case of refusal, the authority having jurisdiction shall quote the reasons and relevant sections of the byelaws which the plans contravene.

3.4.15 If within 45 days of the receipt of the notice under 3.4.1.1 of these byelaws the authority having jurisdiction fails to intimate in writing to the person, who has given the notice, of its refusal or sanction, the notice with its plans and statements shall be deemed to have been sanctioned provided nothing shall be construed to authorize any person to do anything in contravention of or against the terms or lease or titles of the land or against any other byelaw, regulation or ordinance, operating on the site of the work.

Once the plan has been scrutinized and objections have been pointed out, the owner giving notice shall modify the plan to comply with the objections raised and re-submit it. The authority having jurisdiction shall scrutinize the re-submitted plan and if there be further objections, the plan shall not be rejected.

Notwithstanding anything contained herein if the structure contravenes any rule or byelaw of this code or is adjudged structurally unsound, the person shall be deemed liable under this code.

3.4.16 *Occupancy Certificate* — No building hereafter erected, re-erected or altered materially shall be occupied in whole or in part until the issue of an occupancy certificate in the form prescribed (see Appendix E) by the authority having jurisdiction affirming that such building conforms in all respects to the requirements of these byelaws and is fit for occupation.

3.5 Unsafe Buildings

3.5.1 All buildings or structures which are structurally unsafe, insanitary or not provided with adequate means of egress or which constitute a fire hazard or are otherwise dangerous to human life or which in relation to existing use constitute a hazard to safety or health for any reason of inadequate maintenance, dilapidation or abandonment are, for the purpose of this section, unsafe buildings. All such buildings shall be considered to constitute danger to public safety which shall be abated by repairs or demolition or as otherwise directed by the authority having jurisdiction.

3.5.2 *Examination of Unsafe Buildings* — The authority having jurisdiction shall examine or cause to be examined every building reported to be unsafe or damaged, and shall make a written record of such examination.

3.5.3 *Notice to Owner and Occupier* — Whenever the authority having jurisdiction shall find any building, or structure, or portion thereof, to be unsafe as defined under 3.5.1, it shall, in accordance with established procedure for legal notice, give to the owner and occupier of such building or structure written notices stating the defects thereof. This notice shall require the owner or the occupier within a stated time either to complete specified repairs or improvements or to demolish and remove the building or structure or portion thereof.

3.5.4 *Disregard of Notice* — In case the owner or occupier fails, neglects or refuses to comply with the notice to repair or to demolish the

said building or structure or portion thereof, the authority having jurisdiction shall cause the danger to be removed whether by demolition or repair of the building, structure or portion thereof or otherwise.

3.5.5 Cases of Emergency — In cases of emergency, which, in the opinion of the authority having jurisdiction, involve imminent danger to human life or health, the decision of the authority having jurisdiction shall be final. The authority having jurisdiction shall forthwith or with such notice as may be possible promptly cause such building, structure or portion thereof to be rendered safe or removed. For this purpose, the authority may at once enter such structure or land on which it stands, or abutting land or structure, with such assistance and at such cost as may be deemed necessary. The authority having jurisdiction may also get the adjacent structures vacated and protect the public by an appropriate fence or such other means as may be necessary.

3.5.6 Costs — Costs incurred under 3.5.4 and 3.5.5 shall be charged to the owner of the premises involved. Such costs shall be a charge on the premises in respect of which or for the benefit of which the same have been incurred and shall be recoverable as provided under byelaws.

3.6 Enforcement of Code, Offences and Penalties

3.6.1 Enforcement of Code, Offences and Penalties — Without prejudice to the operation of any other law, it shall be the duty of the authority having jurisdiction to take the necessary measures to institute proceedings against any person who contravenes any of the provisions of this code.

3.6.1.1 Offences and penalties — Any person who contravenes any of the provisions of this code or any requirements or obligations imposed on him by virtue of this code, or who interferes with or obstructs any person in the discharge of his duties, shall be guilty of an offence and upon conviction shall be punished by a fine not exceeding Rs 2 000-00 or imprisonment for a period of 6 months or both. In case the offence is a continuing one, a further fine not exceeding Rs 50-00 a day may be levied after the day of his first prosecution.

3.6.1.2 Further obligation of offender — The conviction of any person for an offence under the provisions of 3.6.1.1 shall not relieve him from the duty of carrying out the requirements or obligations imposed on him by virtue of the provisions of this code and if such requirements or obligations are not complied in accordance with an order made under provisions of 3.6.1.1 the authority having jurisdiction under the provisions of this code may, if necessary and advisable, enter upon the premises in respect of which a conviction has been made and carry out at the expense of the convicted person, the requirements or obligations referred to in the said order and the expense, if not paid on demand, may be recovered with cost in a court of competent authority having jurisdiction, as a charge on the premises.

3.6.1.3 Conviction no bar to further prosecution — The conviction of any person under the provisions of this section for failing to comply with any of the said requirements or obligations shall not operate as a bar to further prosecution under this section for any subsequent failure on the part of such person to comply.

3.6.2 Officers not Liable for Damages — Any officer of the authority having jurisdiction acting in good faith and without malice shall be free from liability for acts done in any action under any provision of this code or by reason of any act or omission in the performance of his official duties.

3.7 Power to Make Rules — The authority having jurisdiction may make rules for carrying out the provisions and intentions of this code provided that any rule shall not be in direct conflict or nullify any of the provisions of this code. Any breach of such rules shall be considered as an offence against this code and shall be punishable on conviction as provided in 3.6.1.1.

PART II

4. STRUCTURAL SAFETY

4.1 General — All structures shall be so designed, built and maintained that under the conditions of dead and live loading, the stresses in any of the materials of construction or in the material on which a structure rests shall not exceed the permissible limits as laid down in the relevant Indian standards.

4.1.1 Additions to Existing Structures — When an existing building or other structure is enlarged or otherwise altered, all portions thereof affected by such enlargements or alterations shall be strengthened, where necessary, so that all loads will be supported safely without exceeding the permissible stresses prescribed for the materials of construction and for the structural members in the relevant Indian Standards.

4.1.1.1 Timber framed structures — No buildings, the external walls of which are of timber framed construction, shall be erected, re-erected or altered materially so as to consist of more than a ground floor and one upper storey. Provided that authority having jurisdiction may by special order grant permission for the erection of such a building of two storeys or for the construction of one or more additional storeys if satisfied that such buildings will be, or are, of thoroughly sound material and construction and can safely support the same.

4.2 Live Loads and Wind Loads in Buildings — Live loads and wind loads shall conform to those specified in IS : 875-1957.

4.3.1 The foundations of every building shall be so designed and constructed as to sustain the dead load of the building and the superimposed load and to transmit the loads to, and distribute them over the soil in such a manner that pressure brought to bear on the soil by these loads shall not exceed the safe bearing capacity of the soil. The safe bearing capacities of the commonly occurring rocks and soils are given in Appendix F.

4.3.2 Soil and Hydrostatic Pressures on Basement Walls—In the design of basement walls and similar approximately vertical structures below ground level, provision shall be made for the lateral pressure of the adjacent soil and the walls shall be designed as retaining walls. Due allowance shall be made for possible surcharge due to fixed or moving loads. When a portion or the whole of the adjacent soil is below a free water surface, computations shall be based on the weight of the soil diminished by buoyancy pressure.

4.3.3 Uplift on Floors—In the design of basement floors and similar approximately horizontal constructions below ground level, the upward pressure of water, if any, shall be taken as the full hydrostatic pressure applied over the entire area. The hydrostatic head shall be measured from the underside of the construction.

4.4 Walls

4.4.1 Minimum Thickness of Walls Excluding Plaster for Residential or Business Masonry Walled Buildings—Every person who undertakes construction of a residential or business masonry walled building shall construct every external wall, every wall abutting on an interior open space and every party wall included in such work in accordance with the minimum thickness excluding plaster given in Table V except as provided under 4.4.2. The thickness shall apply to masonry walls built of bricks or concrete blocks and whether built in the lime mortar (1:3) or cement mortar (1:6) or composite mortar (1:2:9).

4.4.2 Notwithstanding anything contained in Table V, every external wall, every wall abutting on an interior open space and every party wall of any storey whose height from the level of the floor of that storey to the underside of the floor or roof next above it, if any, is more than 3.4 m (or 11 ft) in height, shall be not less than 20 cm (or 8 in.) in thickness.

4.4.3 Minimum Thickness of Masonry Walls Excluding Plaster of Public and Industrial Buildings—Every person who undertakes construction work on a masonry wall of public or industrial building shall construct every external wall and every party wall included in such work in accordance with the plaster as specified under **4.4.3.1**, **4.4.3.2** and **4.4.3.3** and and in every case the thickness shall apply only to walls of brick masonry built in lime mortar (1 : 3) or cement mortar (1 : 6) or composite mortar (1 : 1 : 9).

TABLE V MINIMUM THICKNESS OF EXTERNAL AND PARTY MASONRY WALLS (EXCLUDING PLASTER) OF RESIDENTIAL AND BUSINESS BUILDINGS

(Clauses 4.4.1 and 4.4.2)

NOTES

| STOREY ABOVE GROUND LEVEL | HEIGHT OF WALL IN METRES ABOVE PLASTER LEVEL | LENGTH OF WALL IN METRES | THICKNESS OF WALL IN CENTIMETRES | | | | | Notes | |
|---------------------------|--|--------------------------|----------------------------------|-------------|--------------|-------------|--------------|-------|---|
| | | | Basement Floor | First Floor | Second Floor | Third Floor | Fourth Floor | | Fifth Floor |
| | | | | | | | | | |
| 1 | — | 3-0 | Any length | 30 | — | — | — | — | 1) No storey height is assumed to be more than 4.9 m (or 16 ft) |
| 1 | 3-0 | 4-9 | do | 40 | 30 | — | — | — | 2) Length of wall is the length measured between buttressing or cross walls properly bonded and built into the main walls to give lateral support |
| 1 | 4-9 | 6-0 | do | 50 | 40 | — | — | — | 3) Thickness of wall shall not be less than $\frac{1}{16}$ of storey height |
| 2 | — | 6-0 | Under 10 | 30 | 20 | — | — | — | 4) Thickness of the basement wall shall not be less than $\frac{1}{16}$ of the height of surrounding ground measured from basement floor (see Fig. 4) |
| 2 | — | 6-0 | Over 10 | 40 | 30 | — | — | — | |
| 2 | 6-0 | 9-8 | Under 10 | 40 | 30 | — | — | — | |
| 2 | 6-0 | 9-8 | Over 10 | 50 | 40 | 30 | — | — | |
| 3 | — | 9-0 | Under 10 | 40 | 30 | 20 | — | — | |
| 3 | — | 9-0 | Over 10 | 50 | 40 | 30 | 20 | — | |
| 3 | 9-0 | 13-7 | Under 10 | 50 | 40 | 30 | — | — | |
| 3 | 9-0 | 13-7 | Over 10 | 60 | 50 | 40 | 30 | — | |
| 4 | — | 12-0 | Under 10 | 50 | 40 | 30 | 20 | — | |
| 4 | — | 12-0 | Over 10 | 60 | 50 | 40 | 30 | — | |
| 4 | 12-0 | 18-3 | Under 10 | 60 | 50 | 40 | 30 | — | |
| 4 | 12-0 | 18-3 | Over 10 | 70 | 60 | 50 | 40 | 30 | |
| 5 | — | 15-0 | Under 10 | 60 | 50 | 40 | 30 | 20 | |
| 5 | — | 15-0 | Over 10 | 70 | 60 | 50 | 40 | 30 | |
| 5 | 15-0 | 22-9 | Under 10 | 70 | 60 | 50 | 40 | 30 | |
| 5 | 15-0 | 22-9 | Over 10 | 80 | 70 | 60 | 50 | 40 | |
| 6 | — | 18-0 | Under 10 | 70 | 60 | 50 | 40 | 30 | |
| 6 | — | 18-0 | Over 10 | 80 | 70 | 60 | 50 | 40 | |
| 6 | 18-0 | 27-4 | Under 10 | 80 | 70 | 60 | 50 | 40 | |
| 6 | 18-0 | 27-4 | Over 10 | 90 | 80 | 70 | 60 | 50 | |

FIG. 4. BASEMENT WALL

t , to be not less than $\frac{1}{16}$ and also to be not less than the thickness of the wall at ground floor plus 10 cm

5) Walls are assumed to carry only distributed loads. Point or concentrated loads

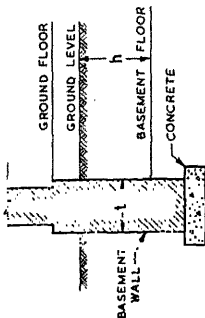


FIG. 4 BASEMENT WALL

t, to be not less than $\frac{1}{16}$ and also to be not less than the thickness of the wall at ground floor plus 10 cm

5) Walls are assumed to carry only distributed loads. Point or concentrated loads where they are not further apart than one metre (or 3½ ft) and are provided with a trimmer beam for proper distribution of these loads are considered as distributed loads

TABLE VI MINIMUM THICKNESS OF EXTERNAL AND PARTY MASONRY WALLS OF PUBLIC AND INDUSTRIAL BUILDINGS

(Clauses 4.4.3, 4.4.3.1, 4.4.3.2 and 4.4.3.3)

| HEIGHT OF WALL (h) IN METRES | | LENGTH OF WALL IN METRES | | THICKNESS t_1 IN CENTIMETRES | THICKNESS t_2 IN CENTIMETRES |
|------------------------------|---------------|--------------------------|---------------|--------------------------------|--------------------------------|
| Exceeding | Not Exceeding | Exceeding | Not Exceeding | | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| — | 7.6 | Unlimited | | 30 | — |
| 7.6 | 9.1 | — | 13.7 | 30 | — |
| 7.6 | 9.1 | 13.7 | — | 40 | — |
| 9.1 | 12.2 | — | 9.1 | 30 | — |
| 9.1 | 12.2 | 9.1 | 13.7 | 40 | — |
| 9.1 | 12.2 | 13.7 | — | 50 | — |
| 12.2 | 15.2 | — | 9.1 | 50 | — |
| 12.2 | 15.2 | 9.1 | 13.7 | 60 | — |
| 12.2 | 15.2 | 13.7 | — | 70 | — |
| 15.2 | 18.3 | — | 13.7 | 60 | — |
| 15.2 | 18.3 | 13.7 | — | 70 | — |
| 18.3 | 21.3 | — | 13.7 | 60 | — |
| 18.3 | 21.3 | 13.7* | — | — | 70 |
| 21.3 | 24.4 | — | 13.7 | 60 | — |
| 21.3 | 24.4 | 13.7* | — | — | 70 |

*The extra 10 cm (or 4 in.) thickness of wall is required because the length exceeds 13.7 m (or 45 ft) which may be confined to pilasters properly distributed, of which the collective widths amount to at least a quarter of total length of the wall.

4.4.3.1 In public and industrial buildings, every external and party wall of any length and of a height not greater than 18.3 m (or 60 ft) and every external and party wall of any height and of a length not greater than 13.7 m (or 45 ft) shall have a thickness not less than 30 cm (or 12 in.) for the top 4.3 m (or 14 ft) and a thickness at the base not less than the appropriate value of t_1 given in Table VI and a thickness not less than t_2 at any height h_1 measured above from base such that,

$$t_2 = 30 \text{ cm} + \frac{(t_1 - 30 \text{ cm})(h - 4.3 \text{ m} - h_1)}{(h - 4.3 \text{ m})}$$

where t_1 and t_2 are in centimetres and h and h_1 in metres.

Thickness t_2 at any height h_1 to be not less than the horizontal distance between the lines AC and BD at the height h_1 , as shown in Fig. 1. The figure is purely diagrammatic.

4.4.3.2 In public and industrial buildings, every external and party wall of height greater than 18.3 m (or 60 ft) and of length greater than 13.7 m (or 45 ft) shall have a thickness not less than 30 cm (or 12 in.)

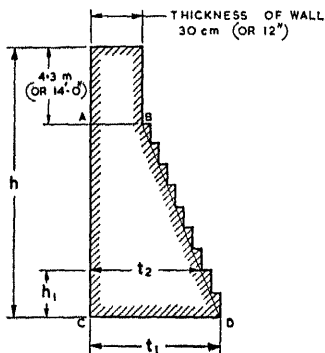


FIG. 1 EXTERNAL AND PARTY WALL IN PUBLIC AND INDUSTRIAL BUILDINGS (DIAGRAMMATIC)

[ANY LENGTH AND A HEIGHT NOT GREATER THAN 18.3 M (OR 60'-0")]

ANY HEIGHT AND A LENGTH NOT GREATER THAN 13.7 M (OR 45'-0")]

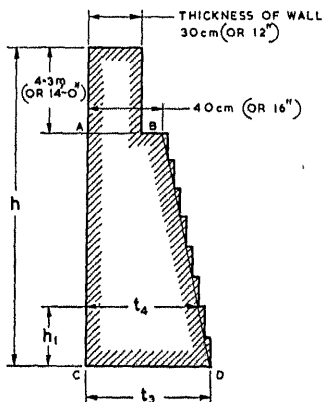


FIG. 2 EXTERNAL AND PARTY WALL IN PUBLIC AND INDUSTRIAL BUILDINGS (DIAGRAMMATIC)

[HEIGHT GREATER THAN 18.3 M (OR 60'-0") AND LENGTH GREATER THAN 13.7 M (OR 45'-0")]

for the top 4.3 m (or 14 ft) and a thickness at the base not less than the appropriate value of t_3 given in Table VI and a thickness not less than t_4 at any height h_1 measured above from base such that,

$$t_4 = 40 \text{ cm} + \frac{(t_3 - 40 \text{ cm})(h - 4.3 \text{ m} - h_1)}{(h - 4.3 \text{ m})}$$

where t_3 and t_4 are in centimetres and h and h_1 in metres.

Thickness t_4 at any height h_1 to be not less than the horizontal distance between the lines AC and BD at the height h_1 , as shown in Fig. 2. The figure is purely diagrammatic.

4.4.3.3 Notwithstanding anything given under 4.4.3.1 and 4.4.3.2, in every case the thickness of the wall in any storey-height shall not be less than 1/14 of that storey-height and if this thickness is more than that given in Table VI, the latter shall be made up to the required storey-height thickness by constructing piers in the manner as shown in Fig. 3.

4.4.4 Minimum Thickness of Walls with Mezzanine Floors—For the purpose of 4.4.1 and 4.4.3, any loft, balcony or mezzanine floor of more than 3 m (or 10 ft) width shall be considered as forming a storey for determining the thickness of the walls which support it.

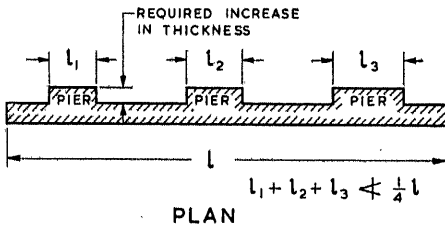


FIG. 3 MANNER OF CONSTRUCTING PIERS TO MAKE UP THE REQUIRED STOREY-HEIGHT THICKNESS OF WALL

4.4.5 Minimum Thickness of Cross Walls— Every person who shall undertake construction work on masonry walled buildings shall construct, in accordance with the following rules, every cross wall included in such work, which in pursuance of the byelaws on that behalf may as a return wall be deemed a means of determining the length of any external wall or party wall of such buildings and in every case the thickness prescribed shall be the minimum thickness of which any such cross wall may be constructed; and the several specifications shall apply only to wall built of brick masonry:

- a) The thickness of every wall shall be at least two-thirds of the thickness prescribed by such byelaw on that behalf for an external wall or party wall of the same height and length and belonging to the same class of buildings as that to which such cross wall belongs, but shall in no case be less than 20 cm (or 8 in.);
- b) But if such a cross wall supports a superincumbent external wall, the whole of such cross wall shall be of thickness prescribed by the byelaw on that behalf for an external wall or a party wall of the same height and length and belonging to the same class of building as that to which such cross wall belongs unless provision is made by reinforced concrete beam or rolled steel joist, adequately supported, or by corbelling so as to carry the superincumbent load of the wall where it is external.

4.4.6 Minimum Thickness When Cement Mortar of Richer Mix is Used— Notwithstanding the thickness of walls as described under 4.4.1, 4.4.2 and 4.4.3 every such wall may be constructed 10 cm (or 4 in.) less in thickness than the thickness prescribed therein if every such wall is built with cement mortar containing not less than one part of cement and not more than four parts of clean sharp sand or other like suitable material or of composite mortar of equivalent strength (1 : 1 : 6) to be approved by the authority, but in no case shall any such wall be less than 20 cm (or 8 in.)

thick for special buildings and 30 cm (or 12 in.) thick for the warehouse class. The walls shall not be of the same minimum thickness for more than two consecutive floors.

4.4.7 Minimum Thickness When Mud Mortar is Used — In case masonry work is done with mud mortar, the following restrictions shall apply:

- a) The height shall not be more than 7.6 m (or 25 ft),
- b) The thickness shall be 10 cm (or 4 in.) more than that prescribed under 4.4.1, 4.4.2 and 4.4.3, and
- c) The pressure at base or any other point shall not exceed 22 tonnes per sq m (or 2 tons per sq ft).

4.4.8 Conditions Under Which Wall Thickness Prescribed Under 4.4.1 to 4.4.5 May be Deviated — In case of building designed by the class of registered architects/engineers who are considered by authority having jurisdiction sufficiently qualified to work out structural strength, the thickness prescribed under 4.4.1 to 4.4.5 may be deviated from, provided the proposal is supported by calculations and a certificate is recorded by the registered architect/engineer in the following form:

Certified that the structural parts of the entire buildings have been designed on the basis of calculations and are considered safe in accordance with the permissible stresses and the slenderness ratio as laid down in relevant Indian Standards.

4.5 Staircase

4.5.1 Construction of Staircase — Every person who undertakes construction work on a building, shall construct every staircase included in such work in accordance with the following regulations:

- a) Where the staircase is of stone and is the sole staircase in the building, each step shall, at each end, be built into a supporting wall or masonry column, and each step shall be cut from one stone and shall be at least 20 cm (or 8 in.) longer than the space between the wall or support at each end thereof and shall be built into the wall or support at least 10 cm (or 4 in.) at each end;
- b) Where the staircase is of iron, each step shall be calculated as a girder supported at both ends or as a cantilever, as the case may be, having a factor of safety of 4 when loaded with a weight of 1.5 kg per linear cm (or 100 lb per linear foot) on each step ;
- c) Where the staircase is of wood, the stringers shall be not less than 4 cm (or 1½ in.) in thickness and of such breadth as will permit 2.5 cm (or 1 in.) above the front edge of the tread and 2.5 cm (or 1 in.) below the bottom edge of the riser; and

NOTE — When the staircase is of wood filled-in with concrete, the stringer shall not be less than 6.4 cm (or 2½ in.) thick.

- d) where a wooden or wooden and concrete staircase exceeds 1.2 m (or 4 ft) clear tread in width, a timber board of size 15.2×6.4 cm (or $6 \times 2\frac{1}{2}$ in.) shall be provided extending throughout each flight of stairs in one piece; where it exceeds 2.4 m (or 8 ft) clear tread in width two similar beams shall be provided and in the case of wooden and concrete staircase the soffit of the staircase shall be plastered.

4.5.2 Passage Giving Access to Staircase — Every person who undertakes construction work on a building shall so construct every passage situated on the ground floor of such building that it shall not, at any point, be less than the width of the staircase which gives access to the building. Provided that if only one such passage gives access to more than one staircase, its minimum width shall be equal to the width of such staircases plus one half of the total width of the remaining staircases.

4.6 Damp-Proofing

4.6.1 Damp-Proofing of Walls — Every wall and pier of the building except when built on materials such as steel or reinforced cement concrete 1 : 2 : 4, shall be provided with a damp-proof course of either of the following:

- a) One part cement, two parts coarse sand and five percent pudlo or some similar waterproofing materials,
- b) Bitumen sheeting,
- c) A layer of 1 : 2 : 4 cement concrete 4 cm (or $1\frac{1}{2}$ in.) with two coats of bitumen on top or with pudlo or composeal,
- d) Impervious stone slabs not less than 5 cm (or 2 in.) thick and 7.5 cm (or 3 in.) wider than the width of basement to be so placed to have 4 cm (or $1\frac{1}{2}$ in.) projections on each side of the basement, the stone slabs being fixed in cement mortar 1 : 2, and
- e) Any other impervious material approved by the authority having jurisdiction.

Such damp-proof course shall be laid at a level not higher than the lowest part or underside of the construction of the ground floor and shall extend to the full width and extent of such walls or piers. It shall be at least 2 cm (or $\frac{3}{4}$ in.) thick. Where the damp-proof course is provided below the plinth level vertical damp-proof course shall be provided between the floor and the inside of the plinth.

4.7 Insulation Against Heat and Cold

4.7.1 Standards of Thermal Insulation — All buildings and structures for the proper insulation of heat and cold may be required by the authority having jurisdiction to comply with the standards of thermal insulation prescribed in the relevant Indian Standards.

4.7.2 Insulation of Roofs — All roofs of habitable rooms in all buildings and structures shall be provided with thermal insulation by any one of the following methods:

- a) By the addition of a layer of some insulating material between the roof and lime concrete terracing,
- b) By the formation of air spaces,
- c) By the use of materials of low conductivity instead of brickwork or concrete, or
- d) As directed by the authority having jurisdiction.

4.8 Sound Insulation

4.8.1 All buildings and structures for the purposes of insulation against sound may be required by the authority having jurisdiction to comply with the standards of sound insulation specified in the relevant Indian Standards.

PART III

5. FIRE SAFETY

5.1 Requirements Pertaining to the Exposure of Exterior Walls

5.1.1 The fire-resistance rating of exterior walls and their distance from the plot line shall be as below:

| | <i>Public Buildings</i> | <i>Residential Buildings</i> |
|--|-----------------------------|----------------------------------|
| Fire-resistance Rating | 2 hours | 2 hours |
| Minimum Distance from the Plot Line | 3.6 m (or 12 ft) | 1 m (or 3 ft) |

5.2 Constructional Requirements

5.2.1 Structural Members — Every structural member or structural assembly, including any wall, partition, floor or roof required by this code to have a certain minimum fire-resistance rating shall be supported by constructions having in no case a lesser fire-resistance rating than the member or the assembly supported. No pipes, wires, cables or other service equipment shall be embedded within the required fire-resisting construction of the structural members.

5.2.2 Walls

5.2.2.1 No external wall and no covering of a roof built or renewed, shall, except with the written permission of the authority having jurisdiction,

consist of wood, cloth, canvas, grass, leaves, mats, thatch, or any other inflammable material. If any external wall or covering of a roof is or has been constructed of any such material, the authority having jurisdiction may, by written notice, require the owner or occupier of the building to which such wall or roof pertains to remove such wall or covering.

5.2.2.2 All load bearing internal walls shall have a minimum fire-resistance rating of not less than 2 hours. Interior, non-load bearing walls may have a reduced fire-resistance rating of not less than 1 hour.

5.2.3 Lintels — Lintels over openings in walls shall have the same fire-resistance rating as that of beams (*see* 5.2.5) provided that when the span does not exceed 2.1 m (or 7 ft) or such opening is spanned by an adequate masonry arch or fire-resisting beam above the lintel, the rating may be reduced to 1 hour.

5.2.4 Columns — Steel or cast iron columns shall be protected with fire-resisting material not less than 2.5 cm (or 1 in.) thick. All spaces between the required fire-resisting material and the member protected shall be of fire-resisting material and the member protected shall be fire-stopped at each floor level for the thickness of the floor. Where the fire-resisting material of columns is likely to be exposed to damage from trucking or handling of merchandise or other goods, it shall be jacketed to a height of 1.5 m (or 5 ft) from the floor with a substantial covering or provided with wheel guards.

5.2.5 Beams and Girders — Beams and girders supporting masonry or reinforced walls shall have a fire-resistance rating of not less than 3 hours. Other beams and girders shall have a fire-resistance rating of not less than 2 hours. Beams and girders shall be individually protected in a manner so as to give them the required fire-resistance ratings.

5.2.6 Trusses — Trusses shall have a fire-resistance rating of not less than 2 hours.

5.2.7 Floors and Roofs — Floor and roof construction shall have a fire-resistance rating of not less than 2 hours. Floor and roof slabs in reinforced concrete construction other than slabs supported on joists shall be at least 10 cm (or 4 in.) thick except in the case of bath rooms and WC, where the thickness may be reduced to 7.5 cm (or 3 in.).

5.2.8 Staircases — Staircases shall have a fire-resistance rating of not less than 2 hours.

5.2.9 Partitions — Nothing in this section shall prevent the erection of temporary partitions of wood, glass or other materials within a room or space.

NOTE — In the case of offices or industrial premises, wood used in partitions should preferably be treated with fire-retardant paint and glass to be used shall be of fire-resisting quality such as wire-glass, etc.

5.2.10 Flooring and Interior Finish — Combustible material used as wall or ceiling finish or as an accoustical covering shall not exceed 2.5 cm (or 1 in.) in thickness except for projecting decorative mouldings and should be preferably treated with a fire-retardant solution.

5.2.11 Pipes, Ducts or Conduit — Where any pipe or duct passes through a floor, the space between the pipe or duct and the floor construction shall be fire stopped. Where the installation of pipes, ducts or conduit in walls, floors or partitions requires the removal of a fire stopping, the space around the pipes, ducts or conduit at such points shall be tightly filled with asbestos or other incombustible material.

5.2.12 Electric Wiring and Installations — The installation of all electrical work including equipment shall comply with the requirements of IS : 732-1958.

5.3 Chimneys, Flues and Smoke Pipes

5.3.1 Materials — Chimneys shall be constructed of bricks, stones or reinforced concrete. When constructed of laid up masonry units, such units shall not be less than 10 cm (or 4 in.) wide laid with full head and bed joints.

5.3.2 Separation from Other Construction — No combustible beams, joists or rafters shall be placed within 5 cm (or 2 in.) of the outside face of chimneys or of masonry enclosing a flue, provided that this distance may be reduced to 1.3 cm (or $\frac{1}{2}$ in.) when the members are faced to their full depth with asbestos insulating material not less than 6.5 mm (or $\frac{1}{4}$ in.) thick.

5.3.3 Bonding — Masonry or reinforced concrete walls of buildings may form part of chimneys when the chimney walls are securely bonded into the walls of the building and when the flue is lined with flue lining as an independent chimney.

5.3.4 Foundations of Chimneys — Masonry or reinforced concrete chimneys shall not rest upon or be carried by wood floors, beams or brackets, nor be hung or supported by metal stirrups from wood construction but shall be built upon concrete or masonry foundations or reinforced concrete slabs properly proportioned to carry the load without danger of settlement or cracking.

5.3.5 Corbelling of Chimneys — Corbelled chimneys shall not be supported by hollow walls, cavity walls or walls of hollow units. Solid walls supporting corbelled chimneys shall not be less than 30 cm (or 12 in.) thick and corbelling shall not project more than 2.5 cm (or 1 in.) per course and not more than 15 cm (or 6 in.) in any case. The total offset, overhang or corbel of an independent chimney shall not exceed $\frac{1}{3}$ of the width of the chimney in the direction of the offset.

5.3.6 Height — Chimneys shall be built at least 1 m (or 3 ft) above flat roofs provided that the tops of chimneys shall not be below the tops of adjacent parapet walls. In the case of sloping roofs, chimneys shall not be

less than 0.6 m (or 2 ft) above the ridge of the roof in which the chimney penetrates and not less than 0.6 m (or 2 ft) above the highest ridge within 3 m (or 10 ft) of the chimney.

5.3.7 Except as provided in these byelaws, every permanently smoke producing apparatus or unit shall be connected with a flue conforming to the provisions of these sections.

5.3.8 Flue Lining — Chimneys built of bricks, stones or other masonry units with walls less than 20 cm (or 8 in.) thick shall be built throughout with fire clay or some other refractory claylining not less than 1.6 cm (or $\frac{5}{8}$ in.) thick, provided that metal or other approved flue liners may be inserted in the flue to reduce it to a desired size.

5.3.9 Separation Between Flues — Where two or more flues are contained in the same chimney, widths of brick or mortar not less than 9.5 cm (or $3\frac{1}{4}$ in.) thick shall be provided at intervals not exceeding 75 cm (or 30 in.) horizontally but not more than 2 flue sections shall be placed side by side without such separation.

5.3.10 Construction — The masonry around each section of the lining shall be filled in with mortar and shall start at least 7.5 cm (or 3 in.) below the centre line of the smoke pipe intake; in the case of fireplaces, it shall start from the apex of the smoke chamber and shall be continuous to the entire height of the flue. Whenever it is necessary to cut a smoke pipe intake opening into a flue lining already set in place, care shall be taken to prevent breaking away of the flue lining. Such opening shall be built as nearly vertical as possible but in no case at an angle greater than 30° from the vertical.

5.3.11 Cleaning — Flues shall be cleaned out thoroughly at the time of construction and shall be left smooth on the inside.

5.3.12 Smoke Pipes — Every smoke pipe shall be connected with a flue by means of a tight joint.

5.3.13 Pipe Intakes — Smoke pipes shall enter chimneys through a fire clay or metal thimble or flue ring of masonry. Neither the intake pipe nor the thimble shall project into the flue.

5.3.14 Ceilings, Roofs and Floors — No smoke pipe shall pass through a ceiling, floor or roof construction of a combustible material. Vents for gas burning appliances shall not be construed to be smoke pipes.

5.3.15 Partitions — Smoke pipes shall not pass through combustible partitions unless protected by a double metal ventilated thimbles 20 cm (or 8 in.) larger in diameter than the pipe. In case the space in between the pipe and the thimble is solidly filled with incombustible insulated material, the space may be reduced to 10 cm (or 4 in.).

5.3.16 Clearance From Combustible Construction — The clear distance in all directions between a smoke pipe and combustible construction including plaster on a combustible base shall be not less than 30 cm (or 12 in.)

provided that this clearance may be reduced when such construction is protected by a cement asbestos board or by rock lath and plaster, 2 cm (or $\frac{3}{4}$ in.) thick or asbestos mill board not less than 6.4 mm (or $\frac{1}{4}$ in.) thick or equivalent approved covering extending the full length of the smoke pipe and not less than 13 cm (or 5 in.) beyond it on all sides, or where plaster is on metal or wire lath.

5.3.17 Fireplaces — The bricks and sides of the fireplace shall be of solid masonry not less than 20 cm (or 8 in.) in thickness. A lining of fire brick at least 5 cm (or 2 in.) thick or other approved material shall be provided unless the total thickness is 30 cm (or 12 in.).

Fireplaces shall have hearths of bricks, stones or other approved incombustible material supported by a fireproof slab or on brick trimmer arches. Such hearths shall extend at least 40 cm (or 16 in.) outside the chimney on the breast and not less than 20 cm (or 8 in.) on the other side along the chimney breast. The combined thickness of the supporting construction shall not be less than 15 cm (or 6 in.) at any point where designed and used for approved gas appliances only, the construction shall be such as shall fully meet the requirements of these regulations.

5.3.18 Fire Prevention — No combustible construction shall be placed within 15 cm (or 6 in.) of the enclosing wall of a fireplace. Combustible or unprotected beams supporting trimmer arches at fireplaces shall be not less than 50 cm (or 20 in.) from the chimney face. No combustible mantel or other wood work shall be placed within 23 cm (or 9 in.) of either side nor within 23 cm (or 9 in.) from the top of a fireplace opening. All spaces on the back of combustible mantels shall be filled with incombustible materials.

5.4 Garages — Garages not of fire-resistant construction shall not approach close: (or 1 ft) to any portion of the dwelling or enclosed projection thereof. Garages located under dwellings shall be of a fire-resistant construction.

5.5 Separation of Business and Residential Portions — In buildings, portions classified as for business occupancy shall be separated from portions classified as for residence occupancy by partitions having a fire-resistance rating of not less than 2 hours.

5.6 Separation of Dwellings — Walls or partitions separating two or more dwellings of other than fire-resisting construction shall consist of a form of construction having a fire-resistance rating of not less than 2 hours.

5.7 Partitions in Block of Flats — In block of flats, partitions, separating individual flats shall have a fire-resistance rating of not less than 2 hours.

5.8 Combustible Materials and Storage Space — No dwelling or any part thereof, or the plot upon which it is situated shall be used as a place of storage, keeping or handling of any combustible article of fire load greater than 100 000 BThU.

PART IV

6. HEALTH, SANITATION AND OTHER REQUIREMENTS

6.1 Means of Access

6.1.1 Every person who erects a building shall provide as means of access to such building a clear way not less than 3.6 m (or 12 ft) in width up to 3 storeys and 5 m (or 16 ft) in width beyond three storeys from a street to the entrance door of such building, such pathway to be, so long as it is used as a means of access to that building, maintained free from any obstruction and shall not at any time cause or permit any portion of any building below a height of 5 m (or 16 ft) to overhang or project over or into such passage.

6.1.2 No building shall be erected so as to deprive any other building of the means of access as provided in this section.

6.1.3 Every person who erects a building shall indicate upon any plan, required to be furnished by him in accordance with these byelaws, the whole area of such means of access by a distinguishing colour and description.

6.1.4 Every person who erects a building shall not at any time erect or cause or permit to be erected or re-erected any building which in any way encroaches upon or diminishes the area so set apart for this purpose.

6.1.5 The space so set apart shall be separately distinguished from any house-gully or open space required to be provided under any other byelaw enforced by the authority having jurisdiction.

6.1.6 Every such means of access shall be drained and lighted to the satisfaction of the authority having jurisdiction and manhole covers or other drainage, water or any other fittings laid in such means of access shall be flush with the finished surface level so as not to obstruct to safe travel over the same.

6.1.7 A person who undertakes construction work on building shall not reduce the access to any building previously existing below the minimum width as required under 6.1.1.

6.1.8 The means of access under these byelaws shall not be deemed to be suitable and sufficient until they have been approved by the authority having jurisdiction who shall have power to prescribe the width of the clear way which he shall communicate.

6.1.9 *Access to Dwelling Units and Rooms* — In every building containing more than one dwelling, access shall be provided to each dwelling unit without the necessity of passage through any other dwelling unit.

6.1.10 No room containing WC shall be used for any purpose except as a lavatory and no such room shall open directly into any kitchen or cooking space by a door, window or other opening. Every room containing WC shall have a door completely closing the entrance to it.

6.2 Open Space Requirements

6.2.1 Open Air Space—Every room intended for human habitation shall abut on an interior or exterior open air space of the width or dimensions specified in the table below or on an open verandah opening on to such interior or exterior open space as aforesaid:

*Where height of building
(above plinth) adjoining
the open air space does
not exceed*

| m | | ft | | m | | ft | |
|------|-----------|------|------------|------|-----------|------|-----------|
| 4.9 | (or 16) | 6.0 | (or 20) | 3.0 | (or 10) | 3.3 | (or 11) |
| 9.0 | (or 30) | 12.0 | (or 40) | 4.0 | (or 13) | 4.7 | (or 15) |
| 15.0 | (or 50) | 18.0 | (or 60) | 5.4 | (or 17) | 6.1 | (or 20) |
| 21.0 | (or 70) | 24.0 | (or 80) | 7.4 | (or 25) | 9.0 | (or 30) |
| 27.0 | (or 90) | 30.0 | (or 100) | 10.6 | (or 35) | 12.2 | (or 40) |

6.2.2 Joint Open Air Spaces—Every such interior or exterior open air space unless the latter is a street, shall be maintained for the benefit of such building exclusively and shall be entirely within the owner's own premises.

If such interior or exterior open air space is intended to be used for the benefit of more than one building belonging to the same owner, then the width of such open air space shall be equal to one-half of the height of the tallest building abutting on such open air space.

If such interior or exterior open air space is jointly owned by more than one person, then its width shall also be as specified above, provided that every such person agrees in writing to allow his portion of such joint open air space to be used for the benefit of every building abutting on such joint open air space and provided he sends such written consent to the authority having jurisdiction for record. Such common open air space shall thenceforth be treated as if it were the open air space required for the purposes of this byelaw. No building shall be erected or extended between such joint open air spaces shall be erected or extended of more than 2.1 m (or 7 ft).

6.2.3 Reduction in the Extent of Open Air Space When More Than One Face of a Room Abuts on Certain Open Space—If a living room of a domestic building derives light and air from two of its sides and if the whole face of one side abuts on a permanently open air space and the whole of the other side on an open space not less than 1.8 m (or 6 ft) in width,

then the extent of the permanently open air space required under 6.2.1 and 6.2.2 may be reduced by 0.6 m (or 2 ft).

6.2.4 Open Space to be Open to Sky—Every open space, whether exterior or interior, provided in pursuance of any regulation or byelaw or under an agreement lodged with the authority having jurisdiction shall be, and be kept free from any erection thereon and shall be open to the sky, and no cornice, roof or weather shade more than 0.75 m (or 2½ ft) wide shall overhang or project over the said open space so as to reduce the width to less than the minimum provided by these byelaws. Every open space or *chowk* provided under these byelaws shall have a suitable and sufficient access. No open drain, except for rain water, shall be constructed in any open space required by these byelaws.

6.2.5 Open Spaces Around Residential Buildings

a) Front Open Space

- 1) Every residential building shall have a front yard of minimum width 3 m (or 10 ft), and in the case of two or more sides a width of an average of 3 m (or 10 ft) and in no case shall it be less than 1.8 m (or 6 ft). Such a yard shall form an inseparable part of the site of the building.
- 2) No erection, re-erection or material alteration of a residential building shall be undertaken if, at the opposite edge of the street on which the building abuts, straight lines drawn downwards and outwards from the line of intersection of the outer surface of any front wall of the building with the roof perpendicular to that line form an angle of more than 45° to the horizontal.
- 3) No work shall be undertaken within 4.5 m (or 15 ft) from the centre line of any street as determined by the authority having jurisdiction.

b) Rear Open Space

- 1) Every residential building shall have a yard of an average width of 4.5 m (or 15 ft) and at no place the yard measuring less than 3 m (or 10 ft) as an inseparable part of the building, except in the case of back-to-back sites where the width of the yard could be reduced to 3 m (or 10 ft), provided no erection, re-erection or material alteration of the building shall be undertaken if at the common plot line straight lines drawn downwards and outwards from the line of intersection of the outer surface of any rear wall of the building with the roof perpendicular to that line form an angle of more than 63½° to the horizontal.
- 2) In the case of residential building whose rear boundary abuts a street, no erection, re-erection or material alteration of that building shall be undertaken if the opposite edge of the back

street on which the building abuts, straight lines drawn downwards and outwards from the line of intersection of the true surface of any rear wall of the building with the roof perpendicular to that line form an angle of more than $63\frac{1}{2}^{\circ}$ to the horizontal.

- 3) *Rear Open Space to Extend Throughout the Rear Wall* — The rear open space provided under the foregoing clauses shall be co-extensive with the entire face of the rear wall. If a building abuts on two or more streets, such rear open space shall be provided throughout the entire face of the rear wall. Such rear wall shall be the wall on the opposite side of the face of the building abutting on the wider street unless authority having jurisdiction otherwise directs.

c) *Side Open Space*

- 1) Every residential building shall have a permanently open air space not less than 1.5 m (or 5 ft) in width on one of its sides other than its front and rear and such side open space shall form an inseparable part of the site. If any of the sides of such building abuts on a street then the side open space shall be equal to the minimum front open space prescribed under 6.2.5(a).
- 2) Every habitable room not receiving its light and air from either the front or rear of a building in accordance with 45° and $63\frac{1}{2}^{\circ}$ rule shall have the whole of one side thereof abutting on open space a permanently inseparable part of the site.

6.2.6 Open Space for Buildings Other Than Residential — The front, rear and side yards, side widths and the rules governing these shall be laid down by the authority having jurisdiction in each case.

The rules applicable to residential buildings with regard to front open space, rear open space and side open space and the angles 45° and $63\frac{1}{2}^{\circ}$ governing erection of buildings shall also be applicable to business and industrial buildings, provided however, that the local authority having jurisdiction may prescribe the front and rear open spaces as required.

6.2.7 Safeguard Against Reduction of Open Space — No construction work on a building shall be allowed if such work operates to reduce an open air space of any other adjoining building belonging to the same owner to an extent less than what is prescribed by any of the byelaws in force at the time of the proposed work or to reduce further such open space if it is already less than that prescribed.

6.2.8 Building Abutting on Two Streets — If a building abuts on two or more streets of different widths, the building shall be deemed for the purpose of this byelaw to face upon the street that has the greater width and the height of the building shall be regulated by the width of that street

and may be continued at this height to a depth of 13.5 m (or 44 ft) along the narrower street subject to conformity with the road angles specified under 6.2.5 and 6.2.6.

6.2.9 Open Spaces with Respect to Covered Area — Whenever the open spaces specified under 6.2.1 do not give the percentage of covered area in conformity with 6.3 the more restrictive of the two shall apply.

6.2.10 Additions or Extensions to a Building — No additions or extensions shall be allowed unless the addition or extension is such as to be made if the whole building was re-constructed from the plinth with the open spaces required under these byelaws applicable to the site of the building at the time of the proposed addition, and no addition or extension to a building shall be allowed which would diminish the extent of air space below the minimum requirement under these byelaws.

6.3 Covered Area — The maximum covered area of buildings of different classes shall be governed by the following:

- a) In a *bazar* or market area, the covered area shall not exceed 75 percent of the area of the site, provided that sufficient off-street parking facilities for loading and unloading of vehicles are provided on the same plot as the building.
- b) In an industrial area, the covered area shall not exceed 60 percent of the site area.
- c) In residential areas, the covered areas shall be as given in Table VII.

TABLE VII COVERED AREA

| AREA OF THE PLOT | MAXIMUM PERMISSIBLE COVERED AREA |
|--|--|
| Less than 200 sq m (or 240 sq yd) | 60 percent of the site area on the ground and first floor and nothing on the second floor except a <i>barsati</i> not exceeding 25 percent of the ground floor |
| 200 sq m to 500 sq m (or 240 sq yd to 600 sq yd) | 50 percent of the site area or 150 sq m (or 180 sq yd) whichever is more |
| 501 sq m to 1 000 sq m (or 601 sq yd to 1 200 sq yd) | 40 percent of the site area or 250 sq m (or 300 sq yd) whichever is more |
| More than 1 000 sq m (or 1 200 sq yd) | 33½ percent of the site area or 400 sq m (or 480 sq yd) whichever is more |

- d) In the case of buildings of mixed class, the covered area shall be determined by the rules pertaining to the particular class for which the particular floor is used or intended to be used. In case where there are two different classes of occupancy on one floor, the covered

area shall be governed by the open spaces required to be left for that particular class of occupancy for each portion of the building in the same floor.

6.4 Projections

6.4.1 No projection of any sort whatsoever extending more than 23 cm (or 9 in.) below a height of 4.3 m (or 14 ft) such as projection on the level of *chabutara*, *chajja*, cornice, water spouts, drains, pipes, advertisement boards and the like shall project over the land of the road or over any drain or over any portion outside the boundaries of the site, provided that projections arising out of the vertical part of the rain water spouts projecting at the road level or the water pipe may be permitted in accordance with the drainage plan.

6.4.2 *Sunshades Over Windows and Ventilators* — Projections of sunshades over windows or ventilators when permitted by the authority having jurisdiction shall fulfil the following conditions:

- a) Notwithstanding anything contained in these byelaws, no projection of any sort shall project over the land and the road or over any drain or over any portion outside the boundaries of the site below a height of 4.3 m (or 14 ft) from the ground level.
- b) Sunshades provided above a height of 4.3 m (or 14 ft) from the ground level shall be permitted to project up to a maximum width of 60 cm (or 24 in.) if the road over which they project exceeds 9 m (or 30 ft) in width.
- c) No projection of any sort whatsoever shall be permitted on roads less than 9 m (or 30 ft) in width or on roads having no footpaths.

6.4.3 *Porticos in Existing Developed Areas* — Porticos in bazar areas of existing developed areas may be permitted to project on road land subject to the following limitations:

Porticos may be allowed on such roads as can leave a minimum clear space of 18 m (or 60 ft) between kerbs or if a stipulation has been made for such construction in the lease deed or in such cases where its construction would completely fill in a gap in the existing arcade, provided that these shall be constructed as follows:

- i) It shall not be less than 3 m (or 10 ft) wide and is either cantilevered or supported on thin steel or RCC pillars.
- ii) Nothing shall be allowed to be constructed on the portico which shall be used as an open terrace.
- iii) Nothing shall be allowed to project beyond the line of arcades.
- iv) The space under the portico shall be paved and channelled according to the directions of the authority having jurisdiction.

6.5 *Distance from Electric Lines* — No *verandah*, balcony, *saiban* or the like shall be allowed to be erected or re-erected or any additions or

alterations made to a building within the distances (quoted below) specified in the current Indian Electricity Rules and its amendments from time to time between the building and any overhead electric supply line.

| | <i>Vertically</i> | | <i>Horizontally</i> | |
|--|--|----|--|----|
| | m | ft | m | ft |
| a) Low and medium voltage lines and service lines | 2.4 | 8 | 1.2 | 4 |
| b) High voltage lines up to and including 33 000 volts | 3.7 | 12 | 1.85 | 6 |
| c) Extra high voltage lines beyond 33 000 volts | 3.7 | 12 | 1.85 | 6 |
| | plus 0.3 m (or 1 ft) for every additional 33 000 volts or part thereof | | plus 0.3 m (or 1 ft) for every additional 33 000 volts or part thereof | |

6.6 Plinth Regulations

6.6.1 *Main Buildings* — No plinth or any part of a building or outhouse shall be less than 30 cm (or 1 ft) above the determined level of:

- the central part of the abutting street,
- the footpath of the abutting street,
- the highest part of a service lane which determines the drainage of the premises, or
- any portion of the ground within 3 m (or 10 ft) distance of such a building.

In cases where the level of the premises is not assured the plinth shall be of the authority having jurisdiction.

6.6.2 *Interior Courtyards* — Every interior courtyard shall be raised at least 15 cm (or 6 in.) above the level of the centre of the nearest street and shall be satisfactorily drained. In the case of *kutchha* courtyards, the level of the courtyard shall be raised at least 15 cm (or 6 in.) above the level of the centre of the nearest street and shall be satisfactorily drained. Common courtyards shall have independent access.

6.6.3 *Plinths of Garages, Stables and Warehouses* — The plinths of garages, stables and warehouses shall not be less than 15 cm (or 6 in.) above the determined level specified under 6.6.1.

6.7 Height Regulations

6.7.1 *Habitable Room* — The height of all rooms for human habitation shall not be less than 2.75 m (or 9 ft) measured from the surface of the

floor to the lowest point of the ceiling, provided that the minimum headroom at any point in the room shall not be less than 2.4 m (or 8 ft).

6.7.2 Bath-Rooms, WCs and Stores — The height of all such rooms measured from the floor to the lowest point in the ceiling shall not be less than 8 ft.

Nothing on the ground floor shall be constructed in such a way as to leave a headway of less than 2.4 m (or 8 ft) provided that in the case of a passage under the landing the minimum headway may be kept as 2.1 m (or 7 ft).

6.7.3 Kitchen — The height of the kitchen measured from the floor to the lowest point in the ceiling shall not be less than 2.75 m (or 9 ft).

6.7.4 Ledge or Tand — It shall have a minimum headroom of 2.1 m (or 7 ft).

6.8 Size of Rooms

6.8.1 Habitable Rooms — The size of habitable room shall not be less than 9.5 sq m (or 100 sq ft) with a minimum width of 2.4 m (or 8 ft).

6.8.2 Kitchen — Every kitchen shall have a floor area of not less than 5.6 sq m (or 60 sq ft) and shall not be less than 1.8 m (or 6 ft) in width at any part. Where there is a separate store, the floor area of the kitchen may be reduced to 4.8 sq m (or 50 sq ft). A kitchen which is intended for use as a dining room also, shall have a floor area of not less than 9.5 sq m (or 100 sq ft) with a minimum width of 2.4 m (or 8 ft). Each kitchen shall be provided with a flue.

6.8.3 Bath-Room and Water Closet — The size of a bath-room shall not be less than 1.5 × 1.2 m (or 5 × 4 ft) or 1.8 sq m (or 20 sq ft); if it is combined bath and water closet, its floor area shall not be less than 2.8 sq m (or 30 sq ft). The minimum floor area of a WC shall be 1.1 sq m (or 12 sq ft).

6.8.4 Ledge or Tand — A ledge or *tand* in a habitable room shall not cover more than 25 percent of the area of the floor on which it is constructed and shall not interfere with the ventilation of the room under any circumstances.

6.8.5 Mezzanine Floor — The minimum size of the mezzanine floor, if it is to be used as a living room, shall not be less than 9.5 sq m (or 100 sq ft).

6.9 Lighting and Ventilation

6.9.1 Lighting and Ventilation of Rooms — Every habitable room shall have, for the admission of light and air, one or more apertures such as windows, fan lights, etc, opening directly to the external air or into an open verandah, and of an aggregate area, inclusive of frames, of not less than :

- a) $\frac{1}{10}$ of floor area excluding doors for dry hot climate, and

- b) $\frac{1}{3}$ of the floor area excluding doors, for wet hot climate.

NOTE 1 — If a window is partly fixed and partly openable, only the latter area will be counted for the above purpose.

NOTE 2 — No portion of a room shall be assumed to be lighted, if it is more than 7.5 m (or 25 ft) away from the door or window which is taken for calculation as ventilating that portion.

6.9.2 Cross ventilation by means of windows shall be effected in at least one living room of a tenement either by means of windows in opposite walls or if this is not possible or advisable, then at least in the adjoining walls.

6.9.3 Mechanised Light and Ventilation — In the case of mechanised light and ventilation, the standards shall be such as to give the same intensity of ventilation as is provided under 6.9.1 and 6.9.7 and subject to the approval of the authority having jurisdiction, provided alternative arrangements for ventilating and lighting the room according to the standards laid down under 6.9.1 and 6.9.7 have also been provided.

6.9.4 Bath-Rooms and Water Closets — Bath-rooms and water closets shall be provided with natural light and permanent ventilation by one of the following means:

- a) Windows having an area of not less than 10 percent of the floor area and located in an exterior wall facing a street alley, yard, or an airshaft whose dimension in the direction perpendicular to the window is not less than $\frac{1}{3}$ the height of the building on which the window is located, subject to a maximum and a minimum limit of 6 m (or 20 ft) and 1 m (or 3 ft), respectively.
- b) Skylights, the construction of which shall provide light and ventilation as required in (a).
- c) Ventilation ducts, provided such ducts have 130 sq cm of area for each sq m (or 2 sq in. of area for each sq ft) of floor area with a minimum total area of 300 sq cm (or 48 sq in.) and a least dimension of 9 cm (or $3\frac{1}{2}$ in.). The vent register or grills to the duct shall be located in or next to the ceiling or the ventilated space. A separate duct from each space or room shall run to and above the roof and shall be provided with a louvered vent stack, provided however when an exhaust fan is used the duct opening may be located in an outer wall.

6.9.5 Stores, Back Rooms and the Like — These will have at least half of the ventilation required for living rooms. Where such ventilation by apertures in walls is not possible or advisable, at least there shall be ventilation by means of a flue or chimney.

6.9.6 Laundry and Recreation Rooms — Laundry and recreation rooms located above the basement shall be lighted by windows located in exterior walls having openings of not less than 10 percent of the floor area.

6.9.7 Basement and Cellars — Basement and rooms located therein except storage room shall be lighted and ventilated by windows in exterior walls having a ventilating area of not less than $2\frac{1}{2}$ percent of the floor area.

6.9.8 Kitchen — Every kitchen shall be ventilated according to the standards prescribed for habitable rooms near the ceiling as far as possible.

6.9.9 Stairways — Every staircase shall be lighted and ventilated from an open air space of not less than 3 m (or 10 ft) depth measured horizontally in case of ground and one upper floor structure, 4.5 m (15 ft) in case of ground and two upper, and in higher structures than this, the open air space shall be not less than 6 m (or 20 ft), provided that the lighting area shall be not less than 1 sq m (or 10 sq ft) per floor height. Every staircase shall be ventilated properly.

6.10 Other Requirements

6.10.1 Construction of Bath-Rooms and Water Closets — Every bath-room or water closet shall

- a) be so situated that at least one of its walls shall open to external air,
- b) not be directly over or under any room other than another latrine, washing place, bath or terrace, unless it has a water-tight floor,
- c) have the platform or seat either plastered with cement or be made of some water-tight non-absorbent material,
- d) be enclosed by walls or partitions of bricks. Surface of every such wall or partition shall be finished with a smooth impervious material such as cement plaster 1.3 cm (or $\frac{1}{2}$ in.) thick or glass glazed tiles or polished marble or any suitable material to a height of not less than 1 m (or 3 ft) above the floor of such a room,
- e) be provided with an impervious floor covering sloping towards the drain, and
- f) have a floor level of such a height so as to ensure suitable grade towards the sewage drain.

6.10.2 Kitchen — Every room to be used as kitchen shall have :

- a) a floor area as provided under 6.8.2,
- b) either a suitable flue for the escape of heated air or be provided with an approved form of smokeless *chulla*,
- c) a height as provided under 6.7.3,
- d) unless separately provided in a pantry, means for the washing up of kitchen utensils which shall lead directly or through a sink to a grated and trapped connection to the waste pipe, and
- e) an impermeable floor.

6.10.3 Mezzanine Floor — A mezzanine floor may be permitted over a room or a compartment provided that:

- a) it conforms to the standards of living rooms as regards lighting and ventilation in case the size of mezzanine floor is 9.5 sq m (or 100 sq ft) or more (see 6.9.1);
- b) it is so constructed as not to interfere under any circumstances with the ventilation of the space over and under it;
- c) such mezzanine floors are not sub-divided into smaller compartments;
- d) such mezzanine floor or any part of it shall not be used as a kitchen;
- e) the aggregate area of such mezzanine floor in a building shall in no case exceed $\frac{1}{4}$ of the plinth area of the building; and
- f) in no case a mezzanine floor shall be closed so as to make it liable to be converted into un-ventilated compartments.

6.10.4 Staircases

6.10.4.1 The minimum clear width of staircases in case of residential buildings shall not be less than 1 m (or 3 ft) except in the case of a single family (three-storeyed building) maisonette in which case the width of the staircase may be reduced to 0.75 m (or 2½ ft).

6.10.4.2 In the case of public buildings, a staircase shall be provided for every 300 persons who are expected to use the building. No staircase shall be less than 1.5 m (or 5 ft) in width and the farthest corner of the building shall not be more than 18 m (or 60 ft) distant from the staircase.

The maximum riser and minimum width of tread of staircases shall be as follows:

| <i>Type of Building</i> | <i>Maximum Riser</i> | <i>Minimum Tread Width</i> |
|-------------------------|----------------------|----------------------------|
| Public Buildings | 15 cm (or 6 in.) | 30 cm (or 12 in.) |
| Domestic Buildings | 19 cm (or 7½ in.) | 25 cm (or 10 in.) |

6.11 Drainage and Sanitation

6.11.1 Sites Containing Deposited Refuse — No building shall be constructed on any site, on any part of which there is deposited refuse, excreta or other offensive matter to which the health authority having jurisdiction objects until such refuse has been removed therefrom and the site has been prepared or left in a manner suitable for building purposes to the satisfaction of the authority having jurisdiction.

Provided that, where it is intended to found a building on piles or on reinforced concrete pillars, the authority having jurisdiction may approve the erection of such building after the refuse has been appropriately treated

by chemicals or in some other manner to the satisfaction of the authority having jurisdiction and has been covered by a layer of sand or other suitable material to a depth of not less than 0.6 m (or 2 ft) or by a layer of cement concrete not less than 15 cm (or 6 in.) thick.

6.11.2 Sites Liable to Floods — No building shall be erected on a site liable to flood or on a slope forming an angle of more than 45° with the horizontal or on soil unsuitable for percolation or in sandy beds, unless it is proved by the owner to the satisfaction of the authority having jurisdiction that erection of such a building will not be dangerous or injurious to health or will not involve danger from flooding or erosion or cause undue expenditure of public funds in the provision of roads, sewers, sanitation, water supply or other public services.

6.11.3 Sites Containing Pits, Quarries, etc — No building shall be erected on a site which comprises or includes a pit, quarry, or other excavation or any part thereof unless such site has been prepared or left in a manner and condition suitable for building purposes to the satisfaction of the authority having jurisdiction.

6.11.4 Damp Sites — Wherever the dampness of a site or the nature of the soil renders such precautions necessary, the ground surface of the site between the walls of any building erected thereon shall be covered with a layer of sound cement concrete not less than 15 cm (or 6 in.) thick or with asphalt paving on a layer of closely packed broken stone hard cake not less than 15 cm (or 6 in.) thick or otherwise rendered damp-proof to the satisfaction of the authority having jurisdiction.

6.11.5 Lowest Storeys on Sites Subject to Flooding — In water logged or low lying areas subject to flooding and where a building has been specifically permitted under 6.11.2, the authority having jurisdiction may require the floor of the lowest storey of such building to be raised above the maximum flood level of the adjoining ground or to such other level as the authority having jurisdiction may prescribe.

6.11.6 Damp-Proofing of Basements — When any habitable room is located in a basement, the floor and exterior walls of such basement shall be so constructed or treated as to render the basement water-tight and damp-proof. In addition, when buildings with basements enclosing habitable rooms are located on a site where ground water conditions exist or are likely to occur such as might cause water to head against the basement walls or floors, the floor and exterior walls shall be backfilled with porous material to within 30 cm (or 12 in.) of ground level and above that with relatively impermeable soil, and an adequate drainage system shall be laid which will collect the water from the bottom of all porous backfills and conduct it away from the building.

6.11.7 Drainage of Sub-Soil — Whenever in the opinion of the authority having jurisdiction the site of a building so requires, the sub-soil shall be

drained effectively by means of sub-soil drains or by other means to his satisfaction.

6.11.8 Surface Water Drains — Any land passage or other area within the curtilage of a building shall, if the authority having jurisdiction so requires, be effectively drained by surface water drains or other means to his satisfaction.

The written approval of the authority having jurisdiction shall be obtained for connecting any sub-soil or surface water drain to a sewer.

6.11.9 Drainage Below Ground Floor Level — In every building, any basement, cellar or other space below the ground floor shall be directly drained or drained by a sump provided with a suitable pump.

6.11.10 Drainage of Roofs

- a) The roof of a building shall be so constructed or framed as to permit effectual drainage of the rain water therefrom by means of a sufficiency of rain water pipes of adequate size so arranged, jointed and fixed as to ensure that the rain water is carried away from the building without causing dampness in any part of the walls or foundations of the building or those of an adjacent building.
- b) The authority having jurisdiction may require rain water pipes to be connected to a drain or sewer to a covered channel formed beneath the public footpath to connect the rain water pipe to the road gutter or in any other approved manner.
- c) Rain water pipes shall be affixed to the outside of the external walls of the building or in recesses or chases cut or formed in such external walls or in such other manner as may be approved by the authority having jurisdiction.

6.11.11 Water Tanks and Cisterns — A tank or a cistern constructed to or filled in connection with a building and intended for storage of water for human consumption or domestic purposes shall comply with the following requirements:

- a) **Water Storage Tank** — The tank shall be constructed of metal, RCC, or lined with metal or metal sheets and be of such a design, weight and quality as has been approved by the authority having jurisdiction. A tank or cistern wholly or partly below the level of the ground shall be water-tight properly covered over and shall be constructed of reinforced concrete or stone masonry or brick work in cement mortar or to a design and according to a manner approved by the authority having jurisdiction and shall be rendered inside with cement mortar.
- b) **Draw Off Arrangement** — The tank shall be provided with a draw off pipe, tap or other apparatus the invert of which shall be not more than 5 cm (or 2 in.) high from the bottom of the tank.

- c) *Overflow Pipe* — The tank shall be provided with an overflow pipe which shall
- 1) be so located and fitted as to prevent entry of animals and insects;
 - 2) not be connected to a drain or sewer; and
 - 3) have an open end to permit the overflow pipe to serve also as a warning pipe.

6.11.12 Pipes and Fittings — All pipes including all bends, junctions, tees and elbows and all fittings used in connection with, or forming part of, the sanitary installation of a building or for the supply and distribution of water to and in a building shall be made of such a material and be of such weight and pattern and be fixed, jointed, and painted in such a manner as may be approved by the authority having jurisdiction.

6.11.13 Sinks

- a) *Location* — A sink shall be so located that at least one of its sides be against an external wall or in a window recess or in a position to ensure suitable connection.
- b) *Materials and Construction*
- 1) Sinks shall be constructed of glazed stoneware, enamelled fireclay or other equally suitable material.
 - 2) They shall be of such shapes as will facilitate their maintenance in a state of cleanliness.
 - 3) No wood work shall be used for covering any such sink.
 - 4) The bottom of the sinks shall slope towards the outlet.
- c) *Sink Waste Pipes*
- 1) A pipe shall be jointed to the sink by a bell mouth at the bottom of the sink, having its internal diameter about one inch larger at the sink end than at the other ends.
 - 2) The sink outlet shall be fitted with a brass grating and a plug.
 - 3) The sink waste pipe shall have an internal diameter of not less than 5 cm (or 2 in.) and be preferably provided with a trap of drawn lead or other equally suitable material fitted with a brass cleaning screw at the bend.

6.11.14 Privy, Type to be Allowed in Any Area — The authority having jurisdiction shall determine in each case whether the premises shall be served by a connected latrine or a septic tank, provided that it shall be a connected latrine if a sewer is within 30 m (or 100 ft) of the site, provided further that until the sewer begins to function a served latrine may be permitted subject to the condition that it shall be converted into a connected latrine as and when required by the authority having jurisdiction.

The authority having jurisdiction may refuse to permit the construction of any latrine or urinal at a particular place if in its opinion, such latrine or urinal would be a nuisance in the neighbourhood or would be objectionable to the occupants of the neighbouring buildings.

6.11.15 Rain Water Pipes — Rain water pipe shall be at least 75 mm (or 3 in.) in diameter and be constructed of copper, cast iron, wrought iron, glazed stoneware, asbestos or other equally suitable material and shall be securely fixed.

A rain water pipe conveying rain water shall discharge directly or by means of a channel into or over an inlet to a surface drain, or shall discharge freely in a compound drained to surface drain but in no case shall it discharge directly into any closed drain.

Whenever a rain water pipe cannot discharge into or over an inlet to a surface drain or in a compound surface drain and if a street drain within 30 m (or 100 ft) from the boundary of the premises, such rain water pipe shall discharge into a gully which shall be connected with the street drain.

If such street drain is not available within 30 m (or 100 ft) of the boundary of the premises, a rain water pipe may discharge over a street provided its outlet is not more than 30 cm (or 1 ft) above the surface of the street.

A rain water pipe shall not discharge into or connect with any soil pipe or soil ventilation pipe or any waste pipe or any waste ventilating pipe, nor shall it discharge into a sewer unless specifically permitted to do so by the authority having jurisdiction in which case such discharge into a sewer shall be intercepted by means of a gully trap.

All sullage drains of a building shall be connected to the back street or land and not on the main road on which the building abuts without the special permission of the authority having jurisdiction.

6.11.16 Wells — Wells intended to supply water for human consumption or domestic purposes shall comply with the following requirements:

a) *Situation* — The well shall be:

- 1) not less than 15 m (or 50 ft) from any ash pit, refuse pit, earth closet or privy and shall be located on a site upwards from the earth closet or privy,
- 2) not less than 18 m (or 60 ft) from any cesspit, soakway or borehole latrine and shall be located on a site upwards from the earth closet or privy,
- 3) so situated that contamination by the movement of sub-soil or other water is unlikely,
- 4) of a minimum internal diameter of not less than 1 m (or 3 ft),

- 5) not under a tree or otherwise it should have a canopy over it, so that leaves and twigs may not fall into the well and rot, and
- 6) *pucca* throughout. *Kutcha* wells shall only be permitted in fields or gardens for purposes of irrigation.
- b) *Well Head* — The wall of the head of the well shall be raised above the level of the adjoining ground to form a parapet or kerb and to prevent surface water from flowing into a well, and shall be surrounded with a paving constructed of impervious material which shall extend for a distance of not less than 1.8 m (or 6 ft) in every direction from the parapet from the kerb forming the well head and the upper surface of such a paving shall be sloped away from the well.
- c) *Rendered Lining* — The interior surface of the lining or walls of the well shall be rendered impervious for a depth of not less than 1.8 m (or 6 ft) measured from the level of the ground immediately adjoining the well head.
- d) *Bucket Wells* — A well from which water is drawn by means of a bucket or other similar apparatus shall be provided with the following:
 - 1) a mosquito-proof type of cover to be approved by the authority having jurisdiction, and
 - 2) a stand for the bucket, raised not less than 15 cm (or 6 in.) above the level of the surrounding paving.

6.11.17 Defective Work — The authority having jurisdiction shall have power to condemn any work, workmanship or materials executed by any person under or by virtue of a pursuant to this part of these rules which in his opinion is unsatisfactory or is likely to constitute a danger to health and any work, workmanship or materials so condemned shall be remedied, amended or made good or shall be removed in whole or in part and replaced by new work, workmanship or materials as the authority having jurisdiction may require until finally completed to his entire satisfaction.

6.12 Water Supply and Sanitary Installations — The requirements regarding water supply and sanitary installations of the buildings shall conform to those specified in IS : 1172-1957.

6.13 Rat-Proofing of Buildings — Every building or part thereof that is designed or intended for use as a dwelling or for the handling, storage or sale of foodstuffs, shall conform to the requirements as follows:

Every such building unless supported on posts shall have continuous foundation walls, extending from at least 60 cm (or 2 ft) below ground level to at least 15 cm (or 6 in.) above ground level or shall have a continuous floor of masonry or reinforced concrete or other equally rat-proof material.

All openings in such foundations or floors, windows and drains, and all junctions between foundation walls and building walls shall be effectively rat-proofed, i.e. windows and doors shall be tight fitting, other openings shall be securely covered with rat-proof screening or grillage or shall be tightly closed with metal sheeting, concrete or other equal rat-proof material.

6.14 Architectural Features

6.14.1 Application — The rules given in this section shall only apply to such area or areas as may be mentioned.

6.14.2 Appearance and Disfigurements — No building shall be erected which in the opinion of the authority having jurisdiction constitutes a disfigurement to or interferes with the aesthetic or other amenities of the area. No constructions or alterations which in the opinion of the authority having jurisdiction will deprive adjoining properties or cause annoyance to residents in the be permitted.

The appearance of all new buildings shall be subject to the approval of the authority having jurisdiction.

6.14.3 Maintenance — The authority having jurisdiction shall be empowered to demand that owners undertake at their own expense any maintenance work that it deems necessary for the decorative repair of buildings. Such work should be completed within the period prescribed in the covering notice.

6.14.4 Verandahs and Advertising Signs — The appearance of all verandahs, advertising signs and similar projections shall be subject to the approval of the authority having jurisdiction, who may demand that such existing structures be altered where necessary at the owner's expense so as to conform harmoniously with the neighbouring area.

6.14.5 Unfinished Buildings — No building shall be left with unfinished portions including projecting reinforcing bars, which in the opinion of the authority having jurisdiction are unsightly unless within the permission prescribing conditions with respect to the structure and the period for which such permissions remain valid.

6.14.6 Clearing of Site building is completed, all rubbish, refuse or debris of any be removed by the owner from the site or sites on which building operations have been carried out or from any adjoining land which may have been used for deposition of materials or debris.

6.14.7 Masts — All wires, poles, masts, stays, struts, lightning conductors and similar fixtures on new buildings shall be straight and of good appearance.

6.14.8 Open Air Dumps — Permanent dumps of scrap-iron, firewood, coal and similar material shall, in all areas except those classified as

factory areas, be allowed only in places enclosed with walls of brick or other similar non-combustible materials.

6.14.9 Unsightly Materials — The use of any disfigured or damaged materials which in the opinion of the authority having jurisdiction results in an unsightly appearance of a building shall not be allowed.

6.14.10 Sheet Metal and Barbed Wire Fences — No sheet metal or barbed wire fence visible externally shall be erected on the frontage line or street line unless the design thereof has been approved by the authority having jurisdiction.

6.14.11 Parks and Gardens — Owners of parks or gardens visible from the streets shall not plant, replace or maintain trees and plants, which, in the opinion of the authority having jurisdiction conflict with the aesthetic appearance of the neighbourhood.

6.14.12 Decoration — Monuments, decorative, and monumental fountains, bridges and viaducts and the decorative and ornamental features of public gardens shall be built only after the approval of the authority having jurisdiction has been obtained, who, in addition to drawings, may demand the submission of photographs, or perspectives of the composition, so that the artistic value of the project will be more efficiently and effectively illustrated.

6.14.13 Composition — Where several facades constitute architectural composition, painting or such other treatment shall only be allowed where no aesthetic disfigurement can result to the composition as a whole.

PART V

7. REQUIREMENTS FOR SPECIFIC USES

7.1 Single Room Tenements — In addition to any other byelaws applicable to such buildings, the following shall apply:

- a) There shall be no back to back rooms in buildings constructed to be used as single room tenements.
- b) No single room tenement wherein cooking is to be done shall be less than 16.8 sq m (or 180 sq ft) in area.
- c) A portion of such room not less than 5.6 sq m (or 60 sq ft) in area may be screened off to form a kitchen as provided under these byelaws and satisfactory arrangements shall be made for smoke disposal.
- d) There shall be provided one floor sink not less than 1×1 m (or 3×3 ft) in internal area in every such kitchen.
- e) A water tap shall be provided in each such tenement.

- f) There may be provided one loft in each such kitchen 0.75 m (or 2½ ft) in width and in length equal to the length of any one face of such kitchen.
- g) There shall be provided one water closet, one enclosed bathroom at least 1.5 sq m (or 16 sq ft) in area and one metal dust bin (of adequate size and with a close fitting cover) for each tenement.
- h) One general washing place shall be provided for every five tenements; the washing place shall be situated on the same floor in proximity to such tenements, and if not otherwise covered on top, shall have roof above it.
- j) Every such tenement shall be provided with at least one access from any one staircase through an open verandah, gallery or passage.
- k) Every such verandah, gallery or passage shall not be less than 1.8 m (or 6 ft) in clear width and shall abut on an interior or exterior open air space of requisite width.
- m) Every such building shall be whitewashed or colour-washed internally and externally at least once in two years to the satisfaction of the authority having jurisdiction.

7.2 Double Room Tenements — In addition to any other byelaw applicable to such buildings, the following shall apply:

- a) No double room tenement (one room and a kitchen) shall contain a living room less than 11.2 sq m (or 120 sq ft) in area and a kitchen room less than 7.5 sq m (or 80 sq ft).
- b) There shall be provided one floor sink not less than 1×1 m (or 3×3 ft) in internal area in every such kitchen.
- c) A water tap shall be provided in each such tenement.
- d) There may be provided at least one loft in each such kitchen 0.75 m (or 2½ ft) in width and in length equal to the length of any one face of such kitchen.
- e) Every such tenement shall be provided with one water closet, one closed bathroom at least 1.5 sq m (or 16 sq ft) in area, one washing place at least 2.2 sq m (or 24 sq ft) in area and one metal dust bin (of adequate size and with a close fitting cover).
- f) Every such tenement shall be provided with at least one access from any one staircase through an open verandah, gallery or passage.
- g) Every such verandah, gallery or passage shall not be less than 1.8 m (or 6 ft) in clear width and shall abut on an interior or exterior open air space of requisite width.
- h) Every such building shall be whitewashed or colour-washed internally and externally at least once in two years to the satisfaction of the authority having jurisdiction.

7.3 Cinemas, Theatres and Public Assembly Halls — In addition to any other byelaws applicable to such buildings, the following shall apply.

7.3.1 No person shall erect a building intended to be used for as a cinema, theatre, or public assembly hall, or convert the use of any existing building to any such purpose, unless such building is set back at least 6 m (or 20 ft) from the regular line of the street or from the street if no such regular line exists.

7.3.2 If any portion of such building is intended to be used as a domestic building, such portion (except accommodation for the caretaker and his family) shall comply with the provisions of byelaws for domestic buildings.

7.3.3 Every such building shall be constructed of fire-resisting materials throughout.

7.3.4 Not more than one auditorium shall be permitted in any such building. The auditorium shall have a clear height of not less than 3.7 m (or 12 ft); provided however that the average clear ceiling height beneath or above any mezzanine or balcony shall not be less than 3 m (or 10 ft); provided further that the lowest point on the soffit of a ceiling or beam, girder or truss projecting below a ceiling shall be not less than 2.4 m (or 8 ft) above the floor directly beneath it.

7.3.5 Balconies or galleries shall be restricted to 25 percent of the total accommodation of such buildings and the maximum slope of the balcony or gallery shall not exceed 35 degrees.

7.3.6 The standard of ventilation shall be 28 cu m (or 1 000 cft) of fresh air per seat per hour. No door which is a required exit shall be less than 1.2 m (or 4 ft) in clear width and not less than 2.1 m (or 7 ft) in clear height.

7.3.7 The minimum clear width of any public exit in any such building shall be calculated at the rate of 60 cm (or 2 ft) per 100 persons or fraction thereof, likely to use that particular exit. This minimum width shall be cumulatively increased towards the public doorways of the building so that the width of an exit at any point shall, on no account, be less than that calculated at the rate of 60 cm (or 2 ft) for every 100 persons or fraction thereof served at that point. All door shutters shall be such as to open outwards and shall be operable from inside.

7.3.8 Requirements of stairways for cinemas, theatres and public assembly halls shall be the same as for stairways for public buildings prescribed under 6.10.4.2.

7.3.9 The requirements regarding water supply and sanitary installations in such buildings shall conform to those specified in IS : 1172-1957.

7.3.10 For the purpose of these byelaws, each 0.9 sq m (or 10 sq ft) of floor space of an auditorium or assembly hall shall be deemed to be occupied by one person.

7.3.11 Parking Space — All cinemas, theatres and public assembly halls, when erected, shall be provided with parking space for cars, animal-drawn vehicles, rickshaws and cycles in accordance with the following:

- a) *Parking Space for Cars* — Car parking space shall be worked out in accordance with one car parking space for every 50 seats. Where public car parking space for more than 50 percent of the required car parking space is available within 100 m (or 100 yd) from such cinema, theatre or public assembly hall, the required car parking space may be reduced to 50 percent.
- b) *Parking Space for Animal-Drawn Vehicles, Rickshaws and Cycles* — Parking space for animal-drawn vehicles, rickshaws and cycles shall be provided on the exit side and shall be a minimum open space of 168 sq m (or 1 800 sq ft). This open space may consist of two or three open spaces and a cycle stand and in no case shall each such open space be less than 56 sq m (or 600 sq ft). Where a cycle stand has been provided within the building in the basement, this parking space may be reduced to 140 sq m (or 1 500 sq ft).

7.3.12 Every such building shall be provided with at least one single room tenement for the sweeper.

7.4 Factories and Industrial Buildings — Notwithstanding any provisions provided in any part of these byelaws, every factory building or part thereof shall comply with the following additional regulations:

- a) *Site* — The location of the factory site shall be governed by the provisions of the development plan (if any). For cities having no development plans, the factory site shall have to be approved by the authority having jurisdiction.
- b) *Means of Escape in Case of Fire (In Existing Factories)* — Every factory shall be provided with adequate means of escape, in case of fire, for the persons employed therein as follows:
 - 1) Each room of a factory building shall in relation to its size and the number of persons employed in it be provided with an adequate number of exits, not less than two in number for use in case of fire though not necessarily confined to such use, and so positioned that each person will have a reasonably free and unobstructed passage from his work place to an exit.
 - 2) No exit intended for use in case of fire shall be less than 1.2 m (or 4 ft) in width nor less than 2.1 m (or 7 ft) in height; the doors of such exits shall be so arranged as to open immediately from the inside to outside.
 - 3) In the case of a factory building or part of a factory building of more than one storey and in which no fewer than 20 persons work at a time, there shall be provided at least one substantial

stairway of fire-resisting materials permanently constructed either inside or outside the building which affords direct and unimpeded access to the ground level.

- 4) In the case of a factory building or part of a factory building in which 20 or more persons work at any one time above the level of the ground or wherein explosive or highly inflammable materials are used or stored or which is situated below the ground level, the means of escape shall include at least two separate and substantial stairways of fire-resisting materials permanently constructed either inside or outside the building and which afford direct and unimpeded access to the ground level.
 - 5) Every stairway in a factory which affords means of access in case of fire shall be provided with a substantial handrail which if the stairway has an open side shall be on that side, and if the stairway has two open sides, such handrail shall be provided on both the sides.
- c) *Means of Escape in Case of Fire (In New Factories)* — In the case of factories constructed or converted for use as a factory after the date of enforcement of these regulations, the following additional requirements shall apply:
- 1) At least two of the stairways provided shall be of fire-resisting materials.
 - 2) No stairway shall be less than 1.2 m (or 4 ft) in width.
 - 3) All stairs shall have an unobstructed head room of at least 2.1 m (or 7 ft) measured vertically above the tread in line with the face of the riser.
 - 4) In straight treads, the run of the treads shall not be less than 25 cm (or 10 in.) wide and the rise shall not be more than 18 cm (or 7 in.) high. The width of the tread including nosing shall not be less than 27 cm (or 10½ in.).
 - 5) No part of a factory building shall be farther (along the line of travel) than 15 m (or 50 ft) from any one of the fire escapes.
 - 6) Every staircase provided above shall be lighted and ventilated from an air space of not less than 3 m (or 10 ft) depth measured horizontally in case of ground and one upper floor structure, 4.5 m (or 15 ft) in case of ground and two upper, and higher structures than this shall not have an air space of less than 6 m (or 20 ft). Provided that the lighting and ventilating area shall not be less than 1 sq m (or 10 sq ft) per floor height.
 - 7) Every person who undertakes construction of a factory building shall construct every lobby, landing corridor or passage included in such work that it shall in no part be less than 1.2 m (or 4 ft) in width free from encroachment of any kind and its floor shall

be of fire-resisting materials and supported by fire-resisting materials.

- 8) Every hoistway or liftway inside a factory building shall be completely enclosed with fire-resisting materials and means of access to the hoist or lift shall be fitted with doors of fire-resisting materials.

Provided that any such hoistway or liftway shall be enclosed only at the top by some material easily broken by fire or be provided with a vent at the top.

Nothing in the above sub-section shall apply to any factory or class or description of factories for which rules in respect of the means of escape have been otherwise made in terms of Section 38(7) of the Indian Factories Act, 1948.

- d) *Abatement of Overcrowding* — There shall be provided at all times for each person employed in any room of the factory at least 3.4 sq m (or 36 sq ft) of the floor space exclusive of that occupied by the machinery and a breathing space of at least 14 cu m (or 500 cu ft).
- e) *Height of Workrooms* — The internal height of a workroom shall not be less than 4.5 m (or 15 ft) measured from the floor level to the lowest point in the ceiling.

Provided that this byelaw shall not apply to rooms intended for storage godowns and the like purposes but only to rooms occupied by workers for purposes of manufacture, except in case of small factories employing less than 50 workers for purposes of manufacture, and carrying on a class of manufacture which does not give out obnoxious gases and dust injurious to health.

- f) *Percentage of Coverage* — Not more than $\frac{2}{3}$ area of the site may be covered subject to the mandatory open spaces specified as below:

| | |
|------------|------------------|
| Front yard | 7.5 m (or 25 ft) |
| Side yard | 3.0 m (or 10 ft) |
| Rear yard | 7.5 m (or 25 ft) |

- g) *Parking Regulations* — All factory buildings including office buildings shall be provided with adequate permanent parking space within the same plot as the building. Adequate off street facilities for the loading and unloading of merchandise and goods shall be provided within the building or on the same plot in such a manner as not to obstruct traffic movement on a public street or a public alley.

- h) *Disposal of Trade Waste and Effluent* — In the case of a factory where the drainage system is proposed to be connected to the public sewerage system, prior approval of the arrangements shall be obtained from the local authority concerned and a copy of the

approval shall be attached with the notice (see 3.4.1.1). All drainage systems shall be connected by a suitable trap so as to exclude volatile and other objectionable matters.

- j) *Water Supply and Sanitation* — The requirements for water supply and sanitation shall conform to those specified in IS : 1172-1957.
- k) *Spittoons*
 - 1) The number and location of the spittoons to be provided shall be to the satisfaction of the Chief Inspector of Factories.
 - 2) The spittoons shall be either of the following types:
 - i) A galvanized iron container with a conical funnel type cover. A layer of suitable disinfectant liquid shall always be maintained in the container; or
 - ii) A container filled with dry clean sand, and covered with a layer of bleaching powder and quick lime; or
 - iii) Any other type approved by the Chief Inspector of Factories.

APPENDIX A

[Part I, Clause 3.4.1.1]

(Form for first application to erect, re-erect or to make material alteration in any place in a building or to make and enlarge a well)

To

Sir,

I hereby give notice that I intend to erect, re-erect or to make material alteration in building No.....or to make and enlarge well No.....on/in Plot No.....in Colony/Street..... *Mohalla/Bazar/Road* City....., and in accordance with the building byelaws of.....Part I, Sections 3.4.2 and 3.4.3, I forward herewith the following plans and specifications in triplicate duly signed by me and.....the Registered
(name in block letters)

Architect/Engineer, Registered No....., who will supervise its erection.

1. Site Plan
2. Building Plans
3. Water Supply and Sewage Disposal Plans
4. Specifications, General and Detailed

I request that the construction may be approved and permission may be accorded to me to execute the work.

Signature of Owner.....

Name of Owner.....
(in block letters)

Address of Owner.....

Date.....

APPENDIX B

[Part I, *Clause 3.4.3.1*]

(Form for Architectural Supervision)

I hereby certify that the erection, re-erection or material alteration in/of building No.....or construction and enlargement of well No.....on/in Plot No.....in Colony/Street.....*Mohalla/Bazar/Road*.....City.....shall be carried out under my supervision and I guarantee that all the materials (kind, quality and grade) and the workmanship of the work shall be strictly in accordance with the general and detailed specifications submitted along with and that the work shall be carried out according to the sanctioned plans, elevations and sections.

Signature of Architect/Engineer.....

Name of Architect/Engineer.....
(in block letters)

Registered No. of Architect/Engineer.....

Address of Architect/Engineer.....

Date.....

APPENDIX C

[Part I, *Clause 3.4.10(a)*]

(Form for Notice of Commencement)

I hereby certify that the erection, re-erection or material alteration in/of building No.....or construction and enlargement of well No.....on/in Plot No.....in Colony/Street.....*Mohalla/Bazar/Road*.....City.....will be commenced on.....as per your permission, vide No.....dated.....under the supervision of.....Registered Architect/Engineer, Registered No.....and in accordance with the plans, elevations and sections sanctioned, vide No.....dated.....

Signature of Owner.....

Name of Owner.....
(in block letters)

Address of Owner.....

Date.....

APPENDIX D

[Part I, Clause 3.4.9]

(Form for Completion Certificate)

I hereby certify that the erection, re-erection or material alteration in/of building No.....or construction and enlargement of well No.....on/in Plot No.....in Colony/ Street.....*Mohalla/Bazar*/Road..... City.....has been supervised by me and has been completed on.....according to the plans, elevations and sections sanctioned, vide No.....dated..... The work has been completed to my best satisfaction, the workmanship and all the materials (kind, quality and grade) have been used strictly in accordance with general and detailed specifications. No provisions of the act or the building byelaws, no requisitions made, conditions prescribed or orders issued thereunder have been transgressed in the course of the work. The building/well is fit for use for which it has been erected, re-erected or materially altered, constructed and enlarged.

Signature of Architect/Engineer.....

Name of Architect/Engineer.....

(in block letters)

Registered No. of Architect/Engineer.....

Address of Architect/Engineer.....

Date:.....

APPENDIX E

[Part I, Clause 3.4.16]

(Form for Occupancy Certificate)

I hereby certify that the erection, re-erection or material alteration in/of building No.....or construction and enlargement of well No.....on/in Plot No.....in Colony/ Street.....*Mohalla/Bazar*/Road..... City.....completed under the supervision of..... Registered Architect/Engineer, Registered No....., has been inspected by me and I declare that the building conforms in all respects to the requirements of building byelaws, in respect of structural safety, fire safety, hygienic and sanitary conditions inside and in the surroundings and is fit for occupation.

Office Stamp

Signature of the Authority.....
having jurisdiction

Date:.....

APPENDIX F

(Clause 4.3.1)

SAFE BEARING CAPACITIES OF ROCKS AND SOILS

| MATERIAL | SAFE BEARING CAPACITY | |
|---|-----------------------|-------------------|
| | Tonnes per sq m | Tons per sq ft |
| a) <i>Rocks and cemented material</i> | | |
| 1. Rocks — hard without lamination and defects, e.g. granite, trap and diorite | 328 | 30 |
| 2. Laminated rocks (e.g. sandstone and limestone) in sound condition | 164 | 15 |
| 3. Residual deposits of shattered and broken bed rock and hard shale; cemented material | 87 | 8 |
| *4. Soft rock | 44 | 4 |
| b) <i>Dense non-cohesive soils</i> | | |
| 1. Gravel; sand and gravel; compact and offering high resistance to penetration when excavated by tools | 44 | 4 |
| 2. Coarse sand; compact and dry | 44 | 4 |
| 3. Fine sand; compact and dry | 22 | 2 |
| 4. Very fine sand; silt (dry lumps easily pulverized by the fingers) | 16 | 1.5 |
| c) <i>Non-cohesive soils in loose conditions</i> | | |
| 1. Loose gravel or sand gravel mixture; loose coarse to medium sand; dry | 22 | 2 |
| 2. Fine sand; loose and dry | 11 | 1 |
| d) <i>Cohesive soils</i> | | |
| 1. Soft shale; hard or stiff clay in deep bed; dry | 44 | 4 |
| 2. Medium clay; readily indented with a thumb nail | 22 | 2 |
| 3. Moist clay and sand clay mixture, which can be indented with strong thumb pressure | 16 | 1.5 |
| 4. Soft clay indented with moderate thumb pressure | 11 | 1 |
| 5. Very soft clay which can be penetrated several centimetres with the thumb | 5 | 0.5 |

*See the definition on page 72.



- *6. Black cotton soil or other shrinkable or expansive clays in dry condition (50 percent saturation)

e) *Organic soils, fills, etc*

1. Fills or made-up ground
 2. Peat, etc
- } see footnote below

DEFINITIONS :

Soft rock — A rocky cemented material which offers a high resistance to picking up with pick-axes and sharp tools but which does not normally require ballasting operations or chiselling for excavation.

Gravel — *Sand and gravel* — A material which contains 90 percent particles greater than 2 mm size and is retained on IS Test Sieve No. 240.

Coarse sand — A material which contains 90 percent particles which are more than 0.6 mm size but not greater than 2 mm and is retained on IS Test Sieve No. 60.

Fine sand — A material containing 90 percent particles greater than 0.06 mm size but not greater than 0.6 mm and is retained on IS Test Sieve No. 8.

Compactness or looseness of non-cohesive material may be determined by driving a wooden picket of dimensions $5 \times 5 \times 75$ cm (or $2 \times 2 \times 30$ in.) with a sharp point. The picket shall be pushed vertically into the soil by the full weight of a person weighing at least 68 kg (or 150 lb). If the penetration of the picket exceeds 20 cm (or 8 in.) the loose state shall be assumed to exist.

Increase or decrease in allowable bearing values:

- a) The allowable bearing values may be increased by an amount equal to the weight of the material removed from above the bearing level.
- b) For non-cohesive soils, the allowable bearing value shall be reduced by 50 percent if the water table is above or near the soil bearing surface. If the water table is below the soil bearing surface at a distance at least equal to the width of the foundation, no such reduction shall apply.
- c) Where bearing capacity of soils is actually measured, the safe bearing capacity of the soil may be determined by the application of an appropriate factor of safety.

*It may be noted that failure of foundation in black cotton soil or expansive clay is often due to expansion of the soil on wetting. A suitable procedure for building on this soil is to construct on it in a dry semi-saturated state and load the same to about 16 tonnes per sq m (or 1.5 tons per sq ft) to counteract the swelling pressure of the clay when fully saturated. Foundation design of this type of soil as also on made-up soil and peat requires careful study and expert technical advice should be taken while designing foundation in such situation. No figures for bearing capacities of these soils can be given in a general way.

TO

IS : 1256-1958 CODE OF BUILDING BYELAWS

(Clause 7.5) — Add the following as a new clause after 7.4:

7.5 Regulation for Central Areas of Cities and Towns

7.5.1 In the case of congested areas of old cities and towns where on account of the high value of land, the tendency to rebuild on the same base persists inspite of the rigorous control exercised by the local bodies, the application of the requirements of the foregoing clauses of this code may not be practicable. The requirements for such areas are, by necessity, different to those applicable to outlying areas in regard to the density of building, control of heights, fire safety requirements, etc. This clause lays down broad guiding principles for enactment of special regulations for such central areas.

7.5.2 It is difficult to define a central area. Central areas could, however, be described by some of their characteristics; these areas are usually heavily congested and are normally the old parts of a city or town which have overgrown their former use. Mixed-use zones are inevitable in such areas which necessitate greater flexibility in the re-arrangement of land uses while replanning such areas. In the re-arrangement of land uses, restrictions are placed on the size of the industrial units as in the case of Bombay which forbid service industries employing more than 9 men in the central areas. Wholesale business is restricted by limiting the storage capacity and the requirements of parking spaces are more than that what would be necessary in outlying areas as the large floating population which comes to the central area daily has to be provided for.

7.5.3 For the purpose of this clause, the following additional definitions shall apply:

- a) *Floor area ratio (FAR)* — Floor area ratio is the ratio of the total area of all the floors including the areas of walls, passages, staircase blocks, sanitary blocks, etc. and accessory buildings to the area of the plot. In all floor area ratios, basements whose height does not exceed 1.2 metres may not be taken into account.
- b) *Courtyard* — An 'inner courtyard' shall mean an open space enclosed on all sides by a building or by a building and a side plot line; and an 'outer courtyard' shall mean an open space similar to an inner courtyard except that one of its sides abuts on a street or other open space on the same plot.

7.5.4 Coverage — No building shall be erected, re-erected or materially altered so as to make the floor area ratio exceed 2.5. However, church

spires, belfries and towers designed for ornamental purposes, chimneys, elevated tanks, staircases and lift rooms and other elevated structures may be permitted in excess of the permissible floor area calculated according to the floor area ratio of 2.5 if their aggregate area is not more than 20 percent of the plinth area of the building.

7.5.5 Front, Rear and Side Yards

7.5.5.1 Front set back — There shall be a front open space having a depth of not less than 1.5 m. Projections at or above the first floor level may be permitted over the front open space, by the authority having jurisdiction, provided there is a clear space of 6 m between the centre line of the road and the projections.

When a plot abuts on two or more streets, the front set back shall be provided on all the streets.

When a plot is away from any street, the front set back shall be equal to half the height of the building and shall in no case be less than 4.5 m in depth.

7.5.5.2 Side open space — There shall be a side open space of not less than 1.5 m so that between two buildings on adjacent plots a common open space of 3 m exists.

7.5.5.3 Rear open space — There shall be a rear open space of not less than 3 m in depth. Provided that when there is a street or common service lane in the rear, such open space shall be measured from the centre line of such street or service lane.

7.5.5.4 Set back from street — No building shall be less than 7.5 m away from the centre line of any street as determined by the authority having jurisdiction.

7.5.6 Courtyards

7.5.6.1 Any inner or outer courtyard upon which windows or doors open shall have an area at all levels of the said courtyard of not less than 10 m². No dimension of an inner or outer courtyard shall be less than one-fifth of the height, above the level of such courtyard, of the highest abutting on the courtyard subject to a minimum of 3 m.

7.5.6.2 Every courtyard and open space on a plot shall have a suitable and sufficient means of access to the satisfaction of the authority having jurisdiction and no open drain, except for rain water, shall be constructed in any such space.

7.5.7 Staircases and Lifts

7.5.7.1 Every person, who erects a building and makes any addition to a building, shall provide in such building one or more staircases each extending from the ground floor level to the highest floor level of the building, in such position or positions that the entrance door of at least one room

of a tenement of a dwelling house or an office building and every room in a public building or a building of warehouse class shall be within an accessible distance of 15 m from at least one staircase, leading up to the floor. The staircase or staircases so provided and intended for 10 or more persons shall be accessible from the street by a passage at least 3 m in width. The staircase or staircases shall be entirely constructed of fire-resisting material and shall be of minimum width of one metre clear.

Every passage giving access to the staircase shall in no part be less than the width of the staircase of such building and its floor shall be of fire-resisting material and carried by supports of fire-resisting material.

Provided that where the staircase is to be used by more than 100 persons, an additional width of 2.5 cm shall be provided for every additional 15 persons. If the number of persons using the staircase exceeds 300, an additional staircase of not less than one metre clear width shall be provided.

For the purpose of this byelaw, each 3 m² of floor space in every kitchen and living room of single and double room tenement and each 4 m² of such space in other dwelling houses shall be deemed to be occupied by one person. For other classes of buildings, the number of persons shall be calculated in accordance with such standards as may from time to time be laid down by the authority having jurisdiction for the purpose.

7.5.7.2 A lift shall be provided if a building has ground and three or more upper floors.

7.5.8 Emergency Staircase — Every building with three or more storeys shall be provided with one emergency staircase 60 cm in width, of fire-proof construction and serving each upper storey in the building, except those floors where the total floor area to be served by such a staircase is less than 300 m² including passages, corridors, etc.

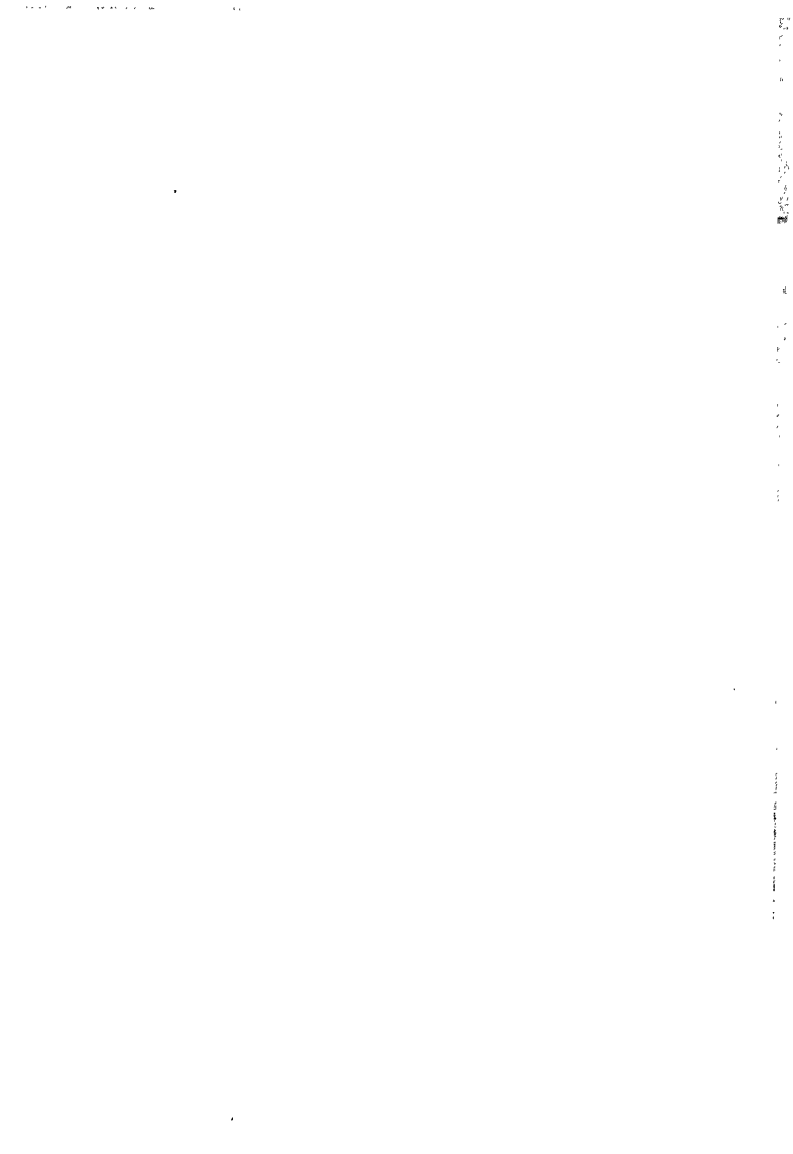
7.5.9 Accessory Building

7.5.9.1 No accessory building shall be higher than 4.5 m nor shall it cover an area greater than 15 percent of the total area of the plot and its area shall be governed by floor area ratio defined for the plot.

7.5.9.2 Accessory buildings may be located in the required side or rear open spaces or on a part of a plot where the main building may be located, provided that they are situated at a distance of not less than 7.5 m from the street line or the front boundary line of a plot and that they shall be separated from the main building by a distance not less than 1.5 m. But when an accessory building is a part of the main building or is located at a distance of less than 1.5 m from the main building it shall be at a distance of not less than 1.5 m from any boundary line of the plot.

7.5.9.3 Private garages not more than 3 m in height may be permitted by the authority having jurisdiction in excess of the permissible floor area ratio, provided that the total area of the garages shall not exceed 10 percent of the area of the plot.

7.5.9.4 No garage which is not fire-proof whether above or below the level of the ground shall be included within the walls of a main building.



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